

# 9

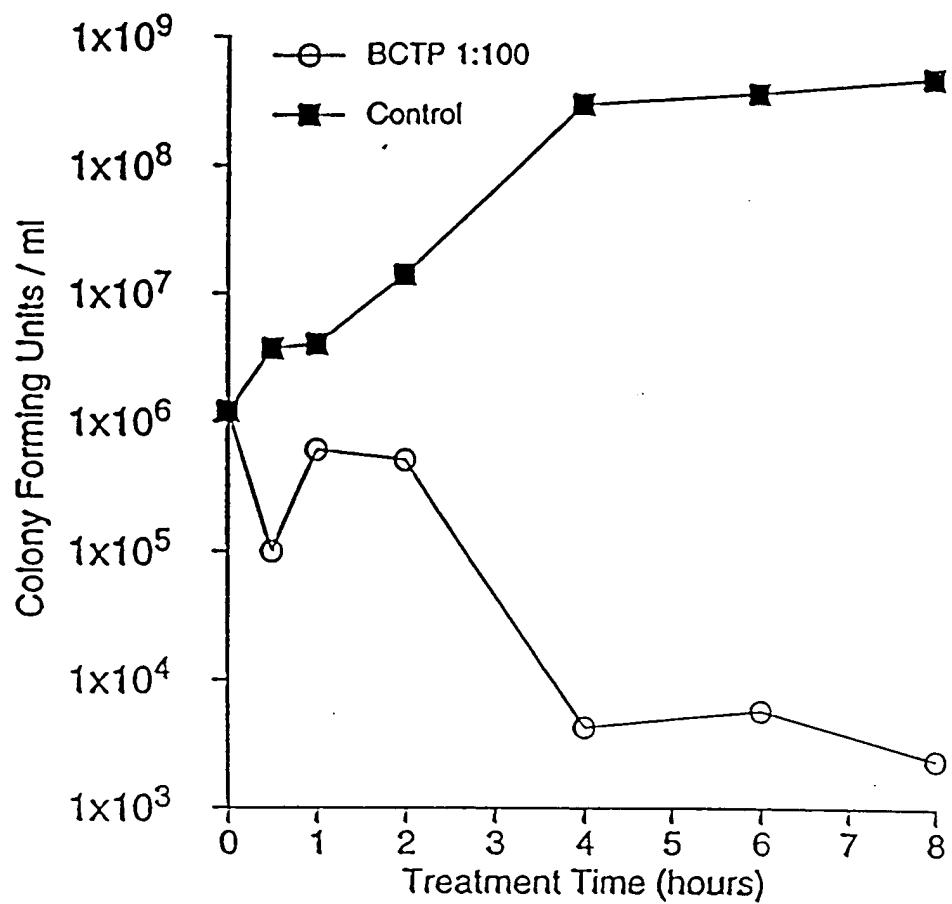
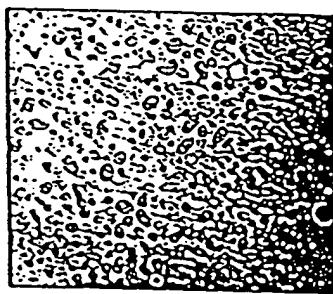


FIG. 1

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FIG. 2A



Time Zero

FIG. 2B



Control  
Spores

1 hour      2 hours      4 hours      6 hours

BCTP-Treated  
Spores



FIG. 2C

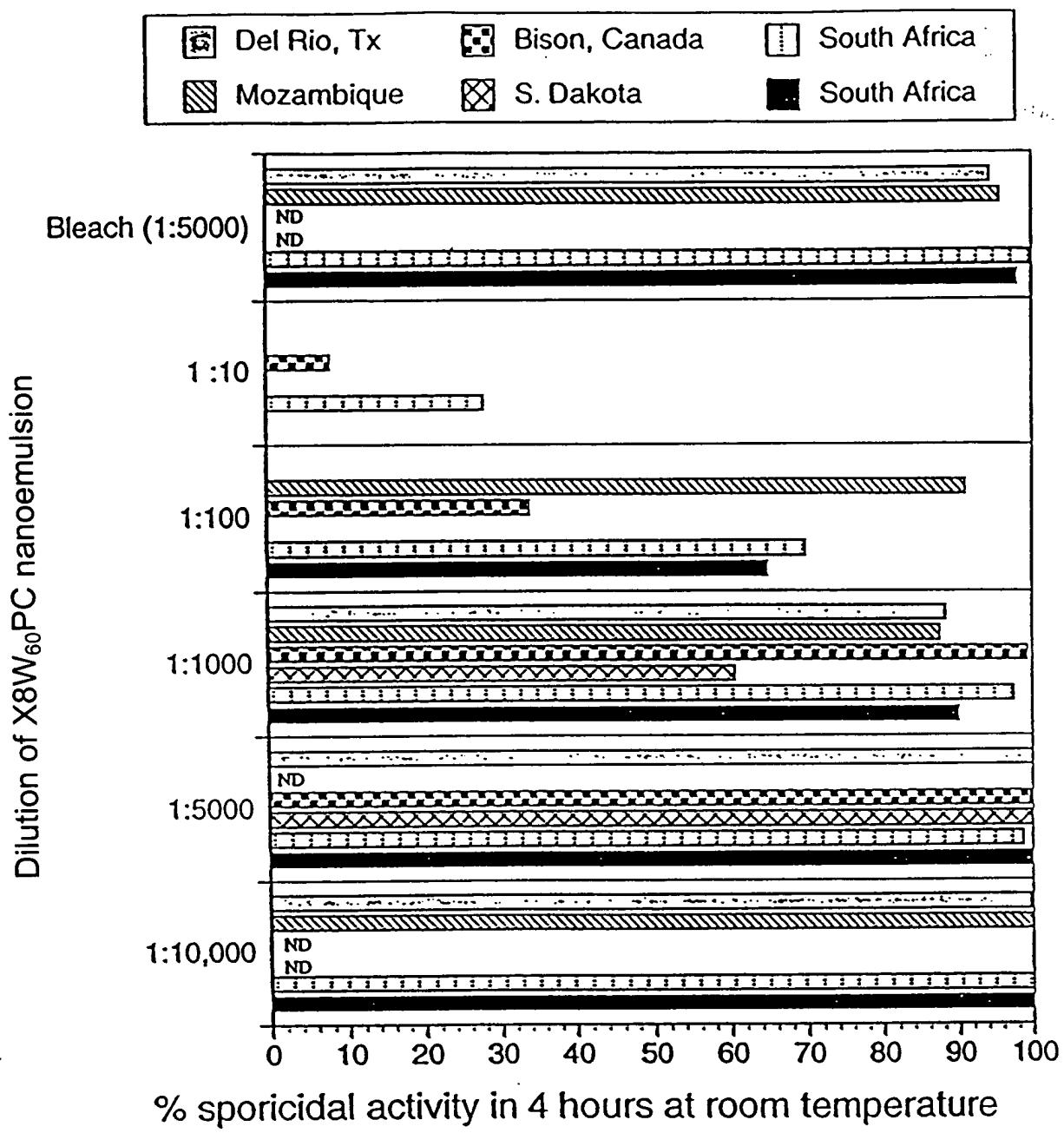


FIG. 3

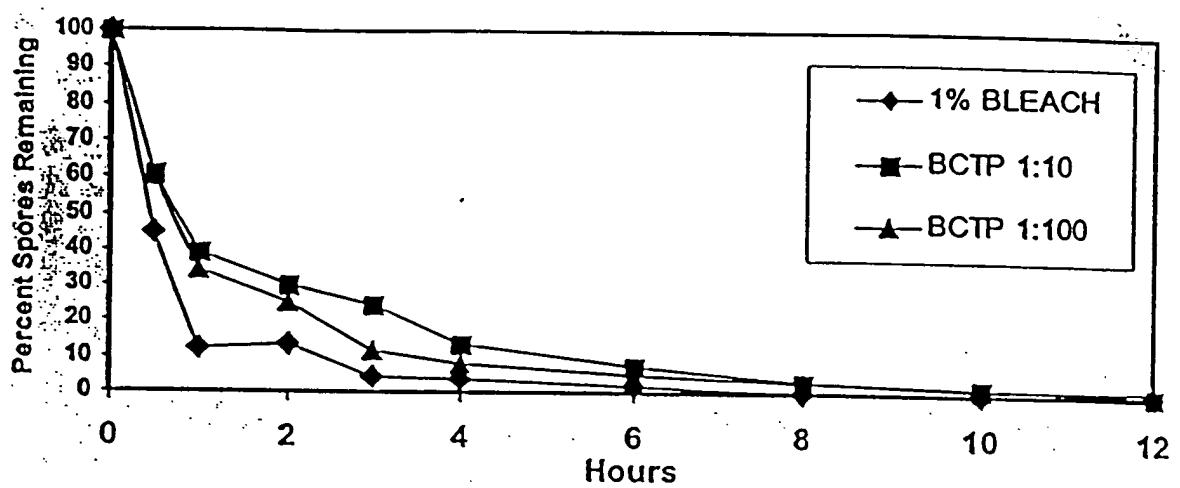


FIG. 4

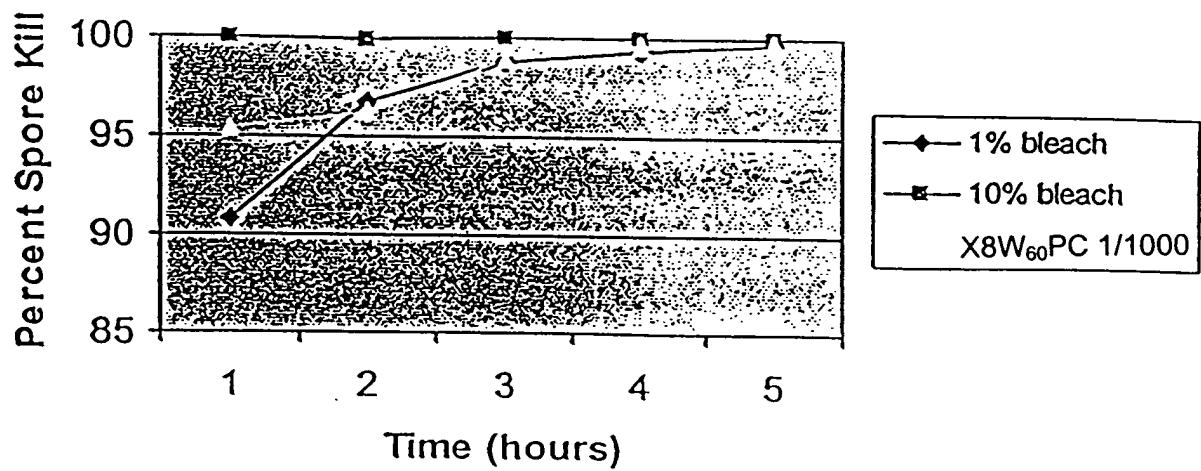


FIG. 5

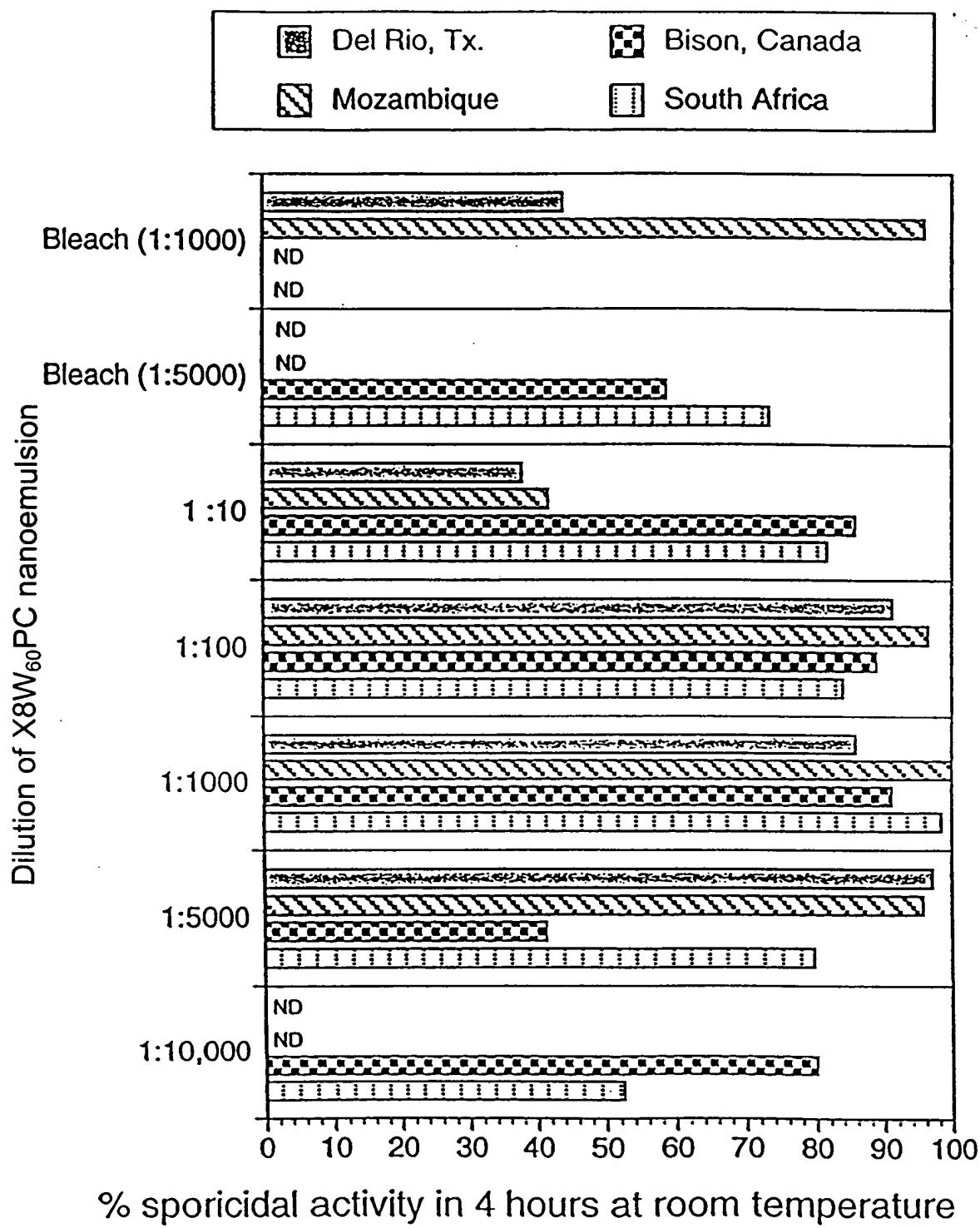


FIG. 6

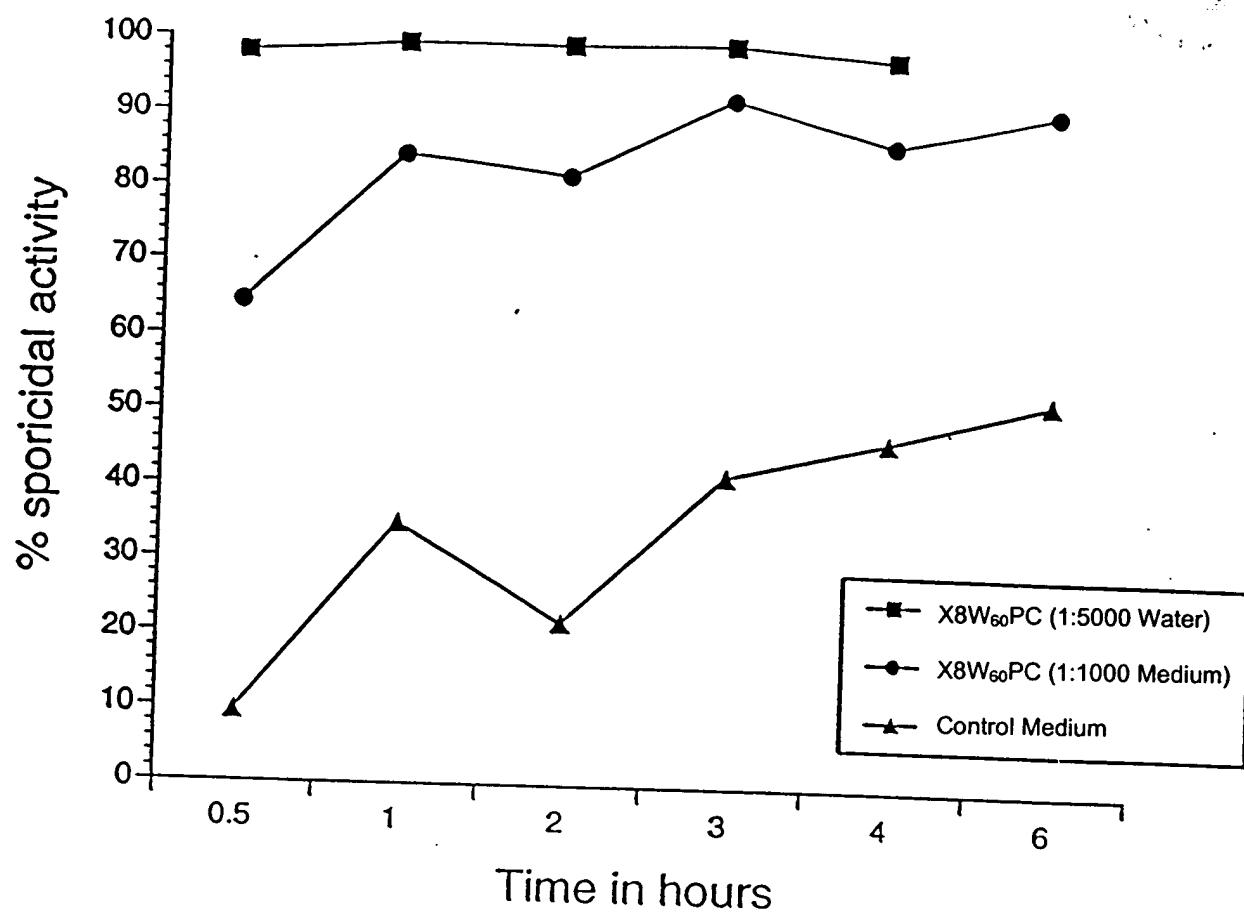


FIG. 7

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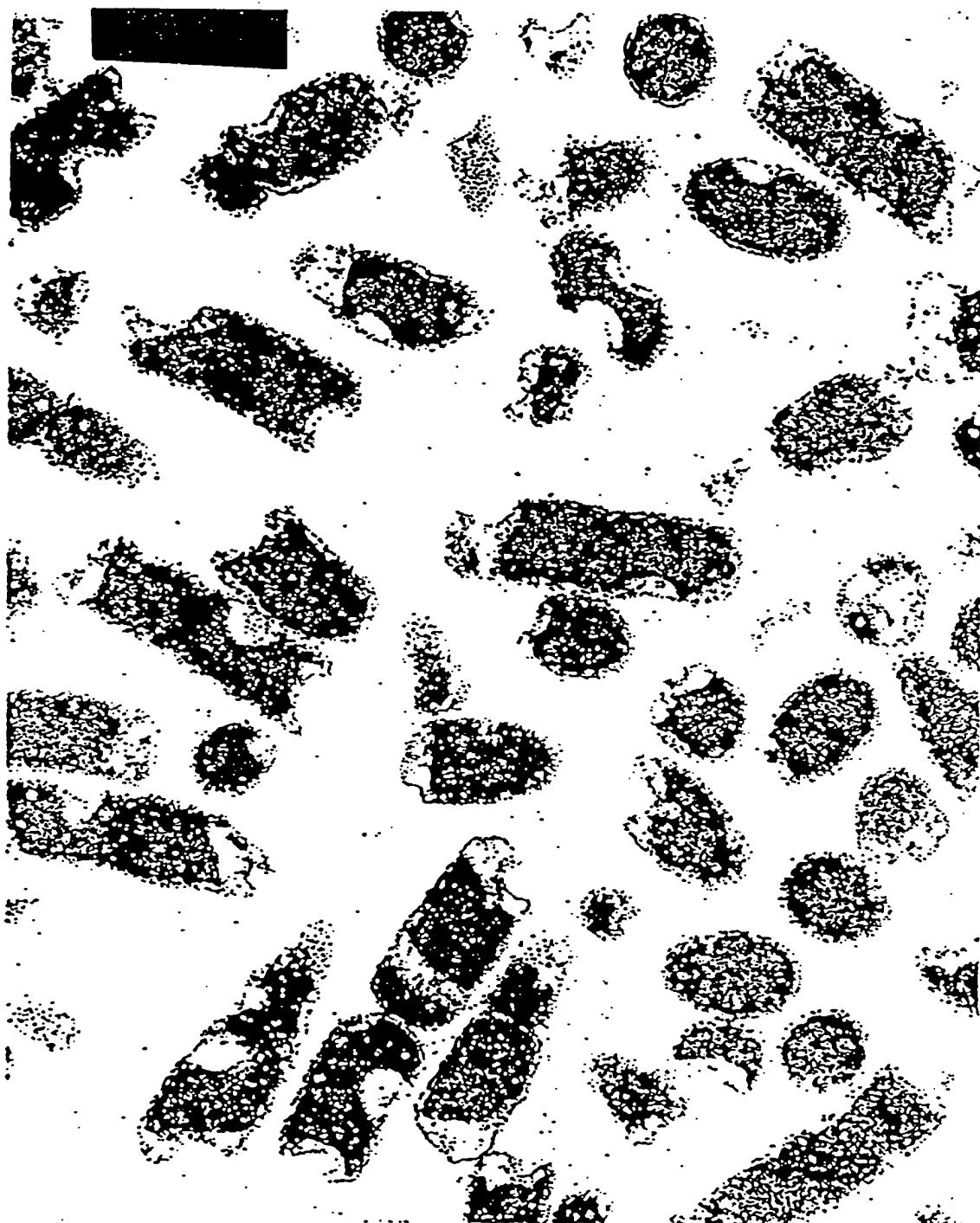


FIG. 8

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FIG. 9

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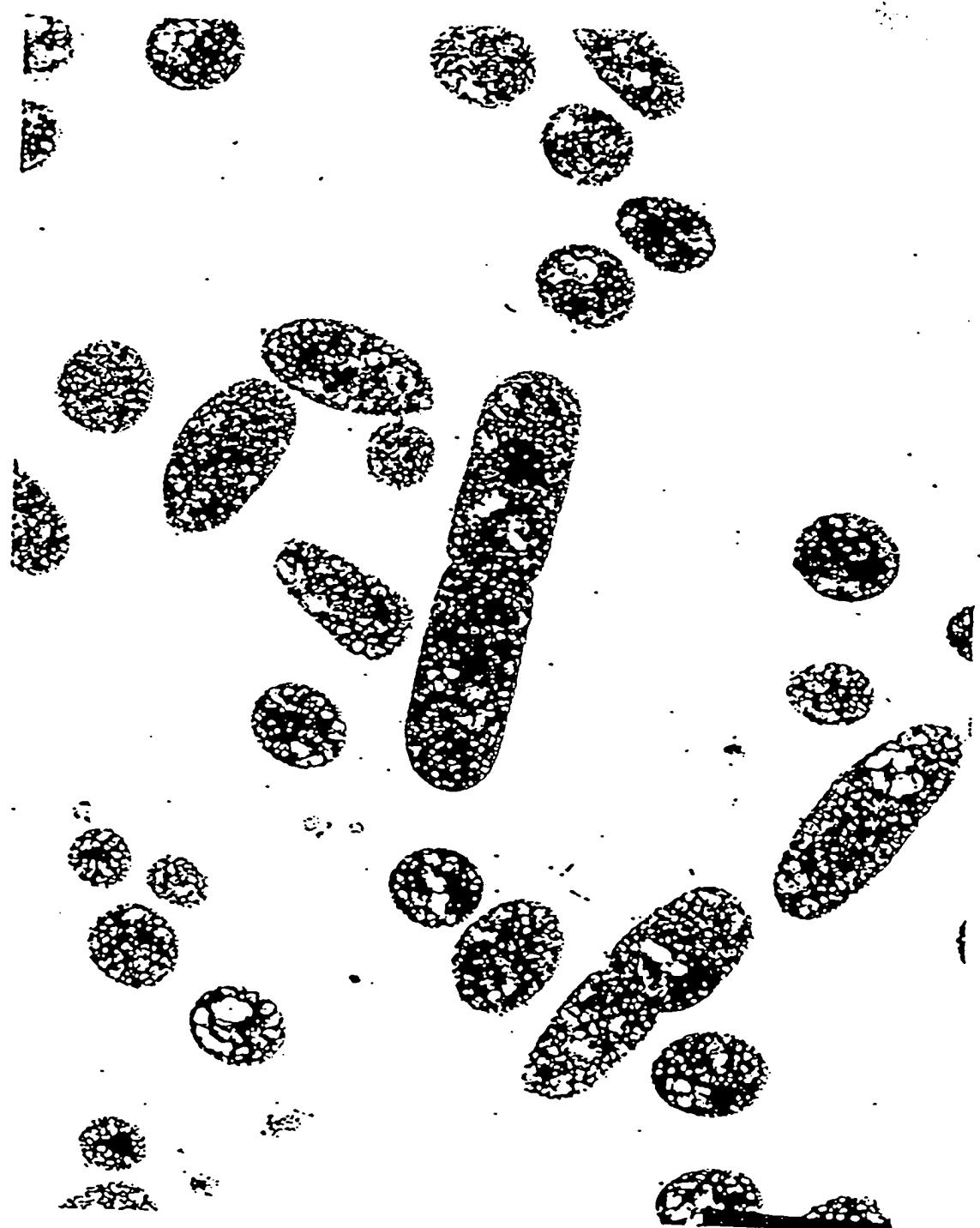


FIG. 10

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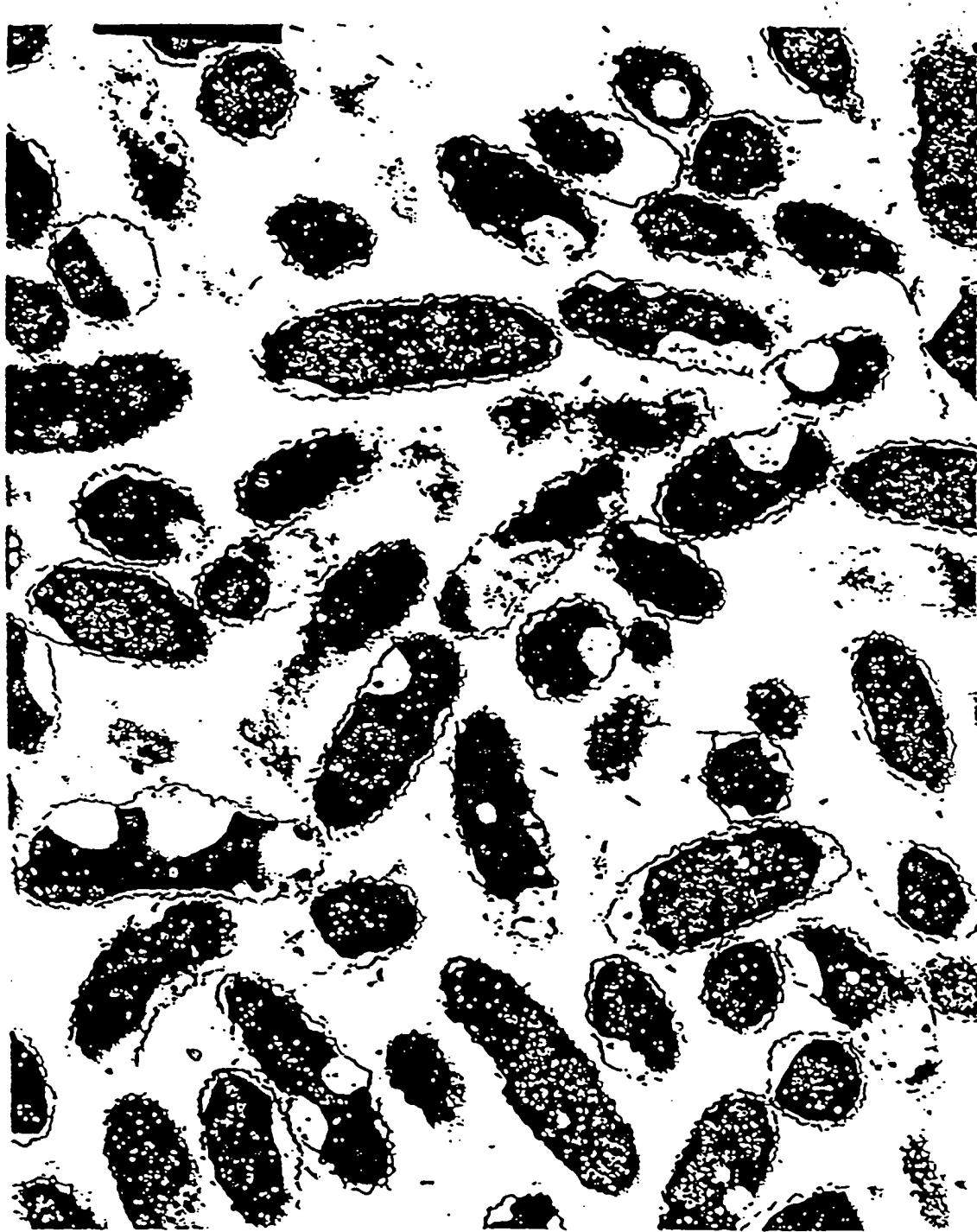


FIG. 11

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FIG. 12

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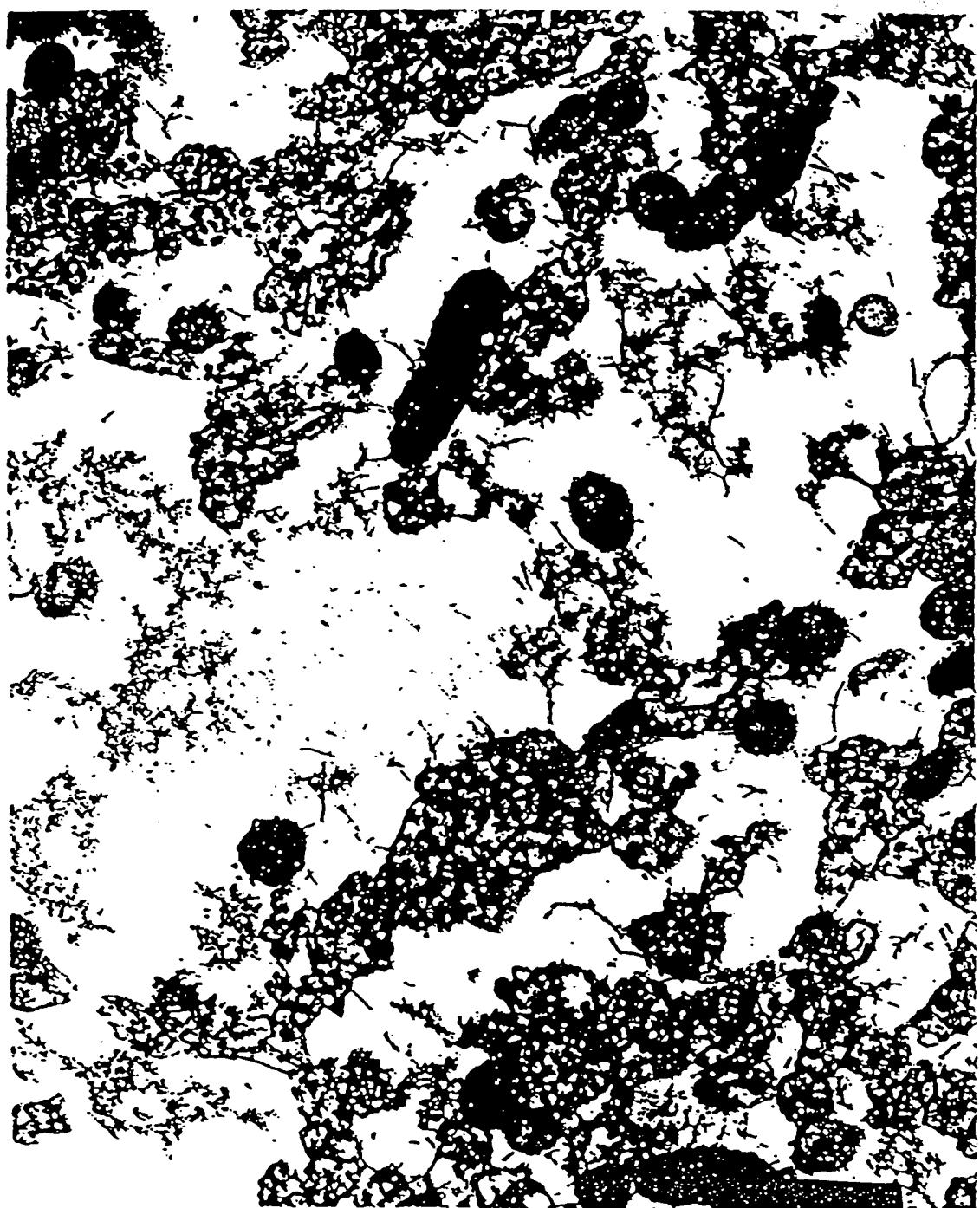


FIG. 13

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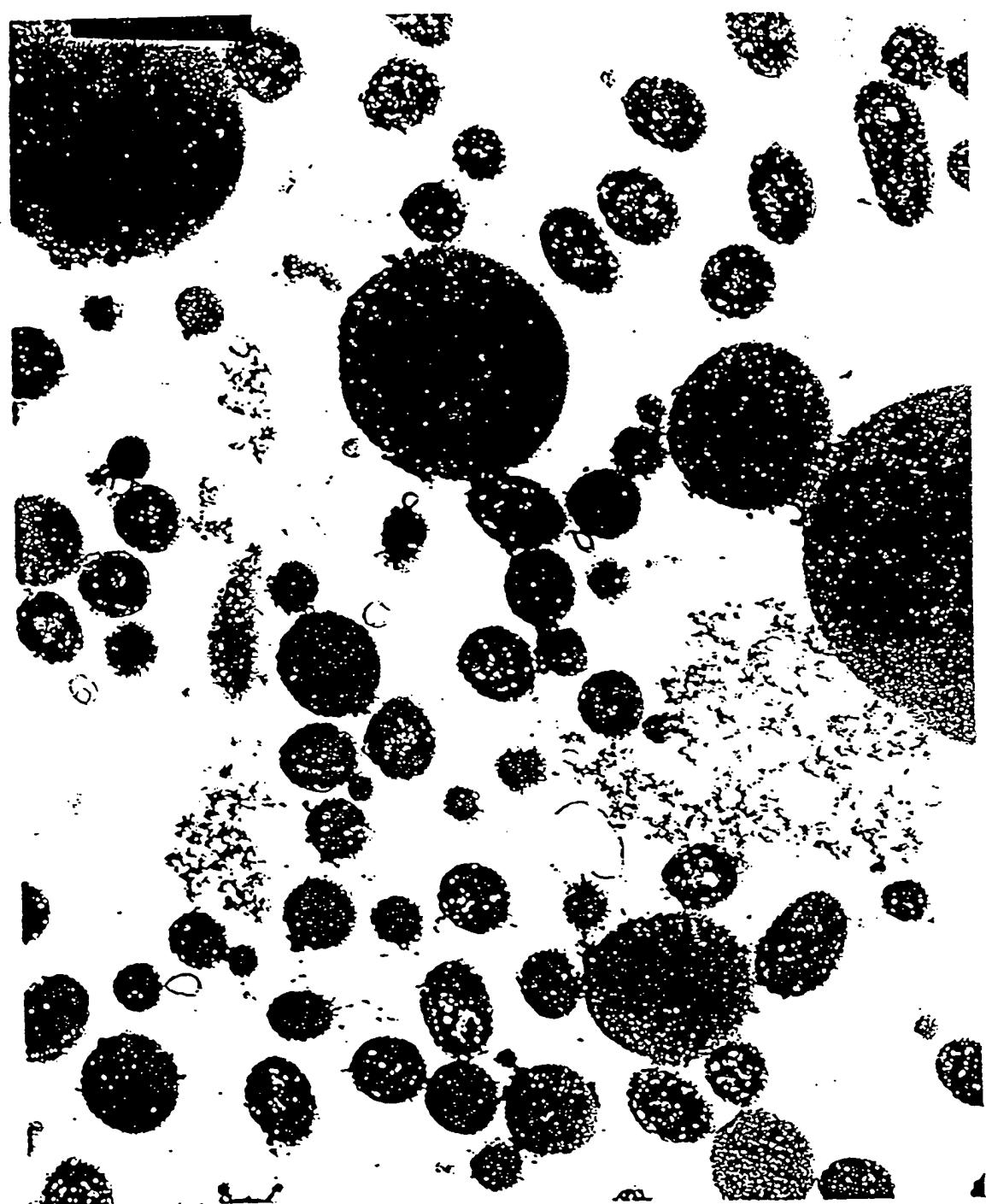


FIG. 14

Effect of BCTP, W<sub>80</sub>8P and X8W<sub>60</sub>PC on Influenza A infectivity

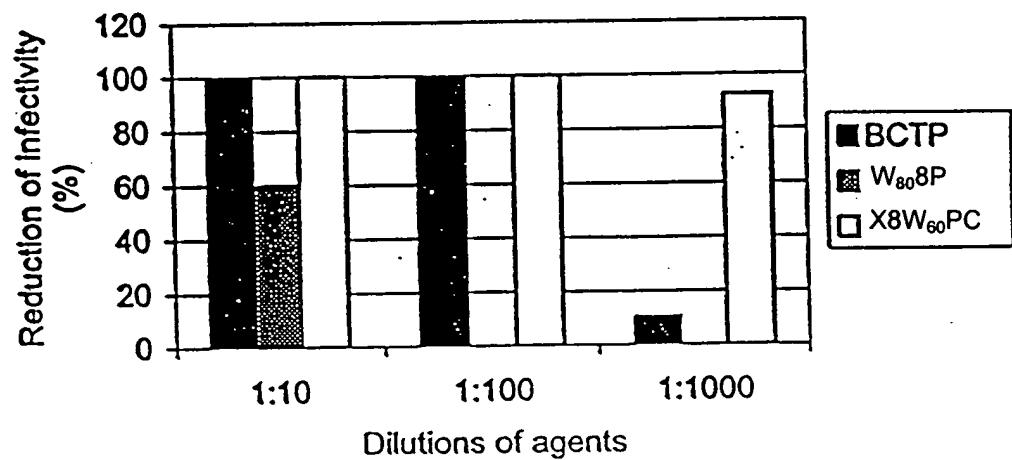


FIG. 15

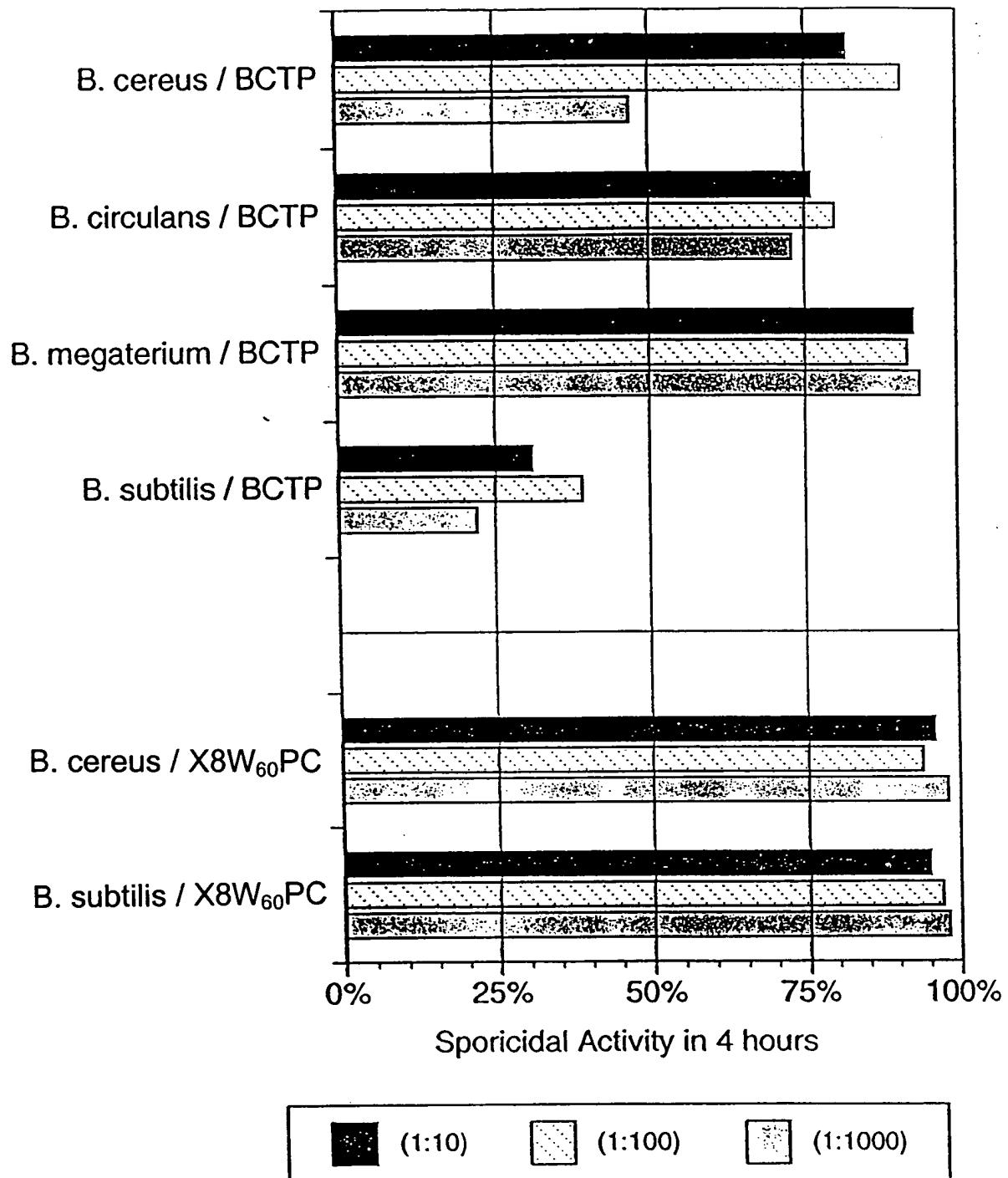


FIG. 16

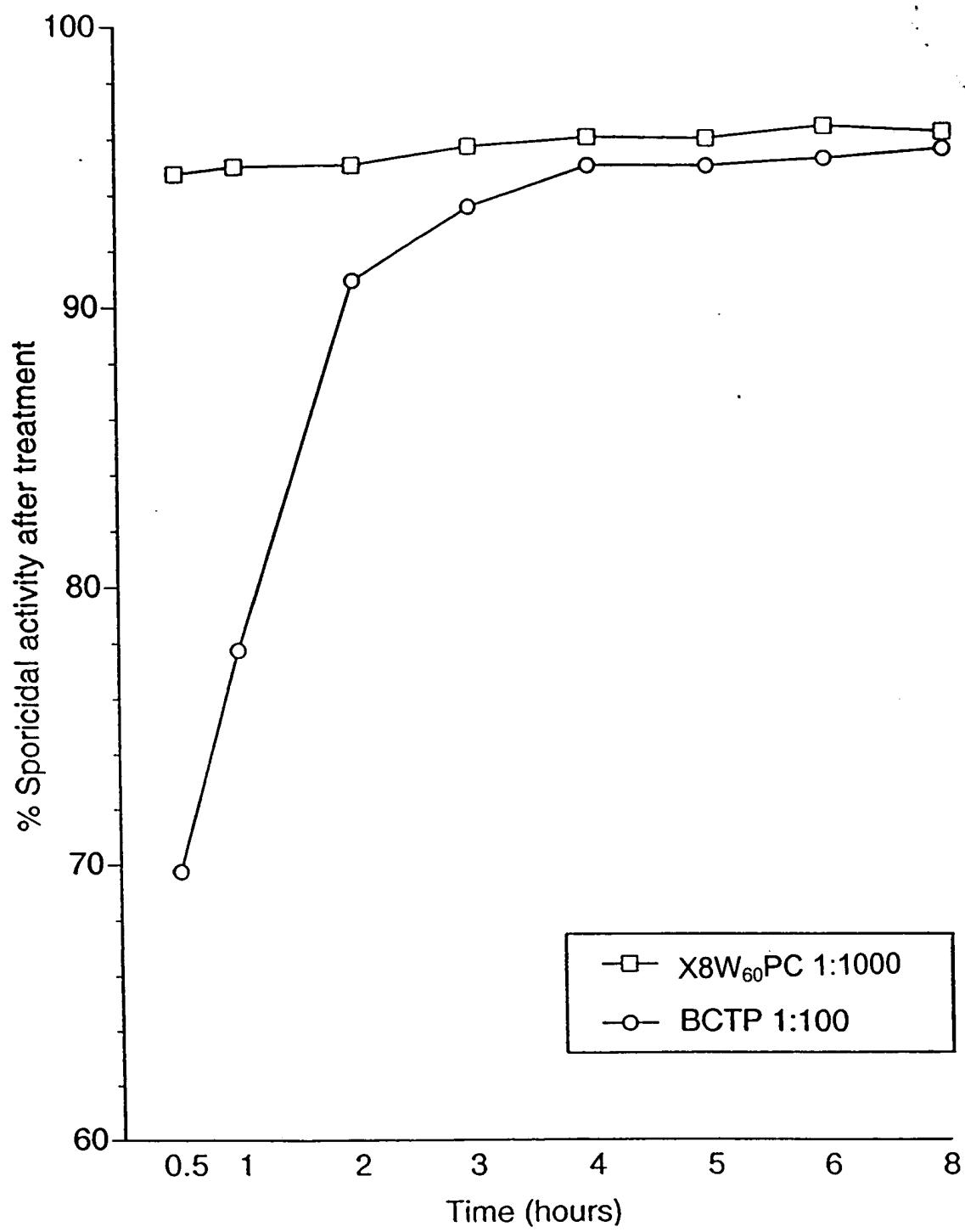


FIG. 17

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Pre-treatment

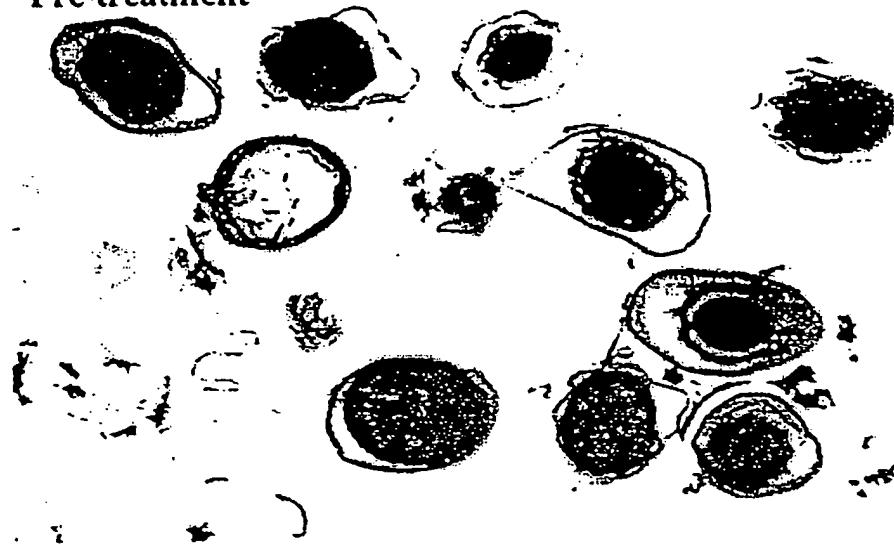


FIG. 18A

Post-treatment

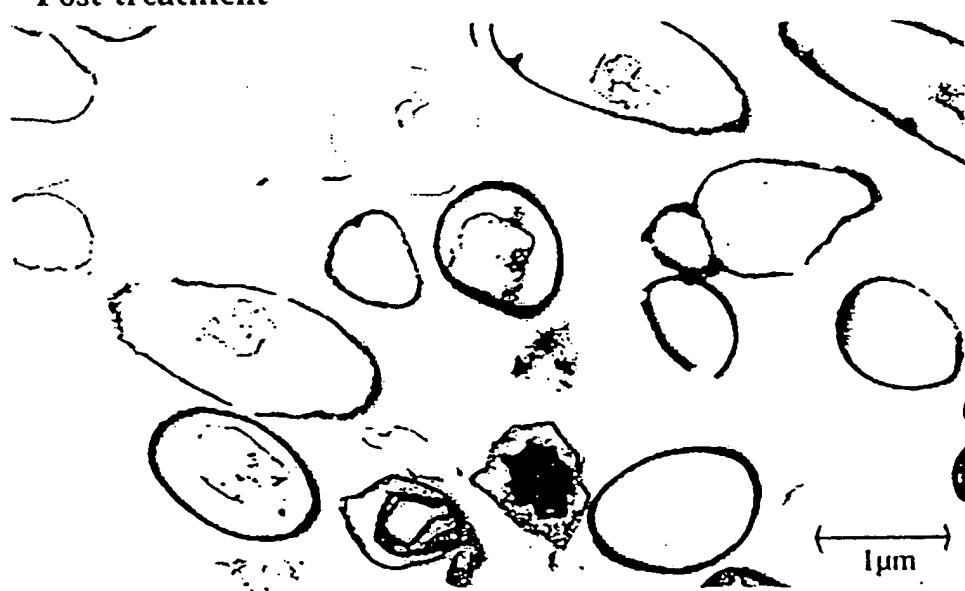


FIG. 18B

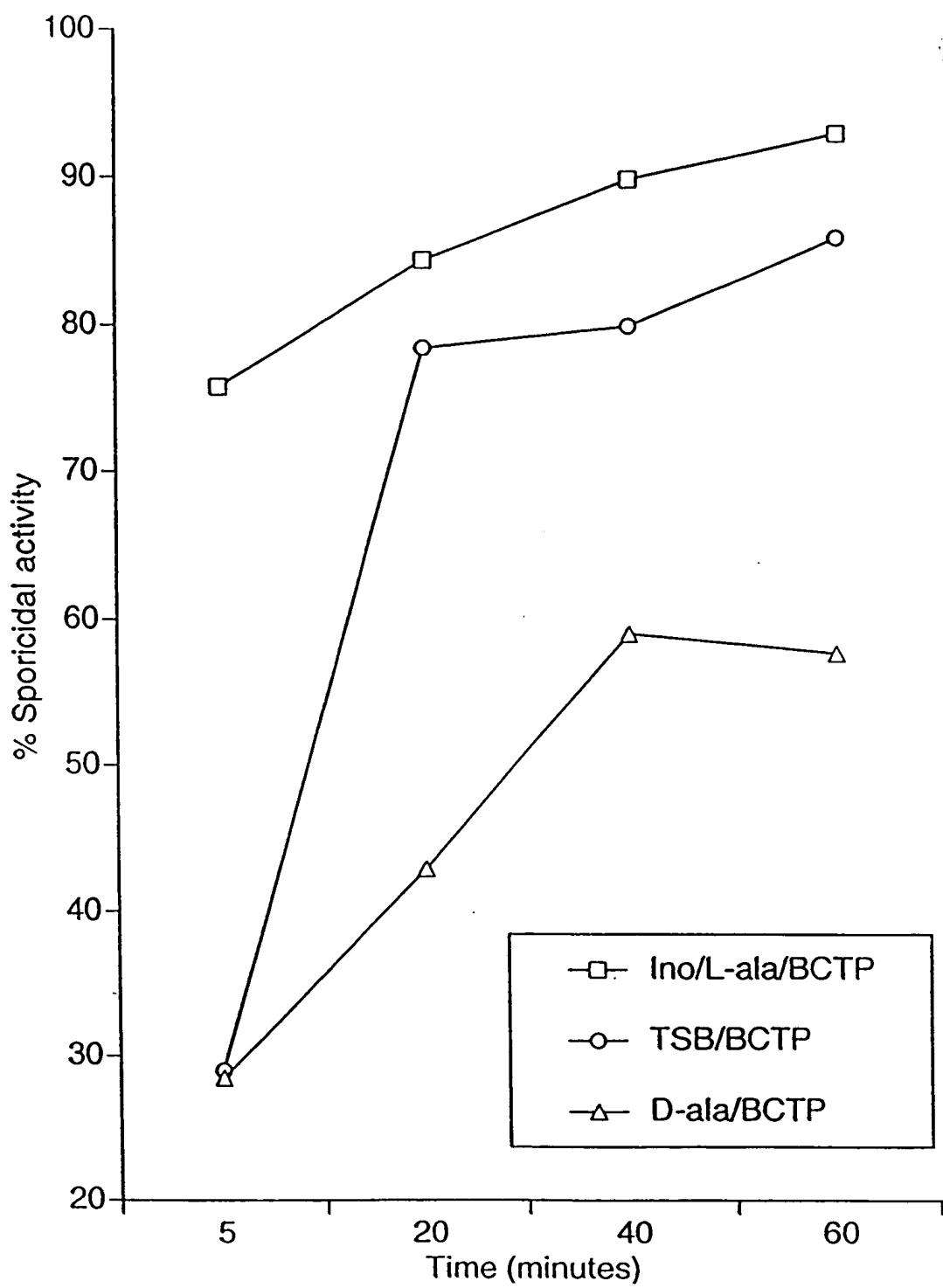


FIG. 19

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Figure 20 A - F & 2.

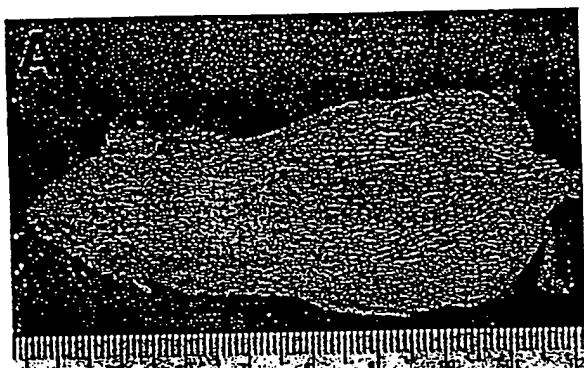


FIG. 20A



FIG. 20B

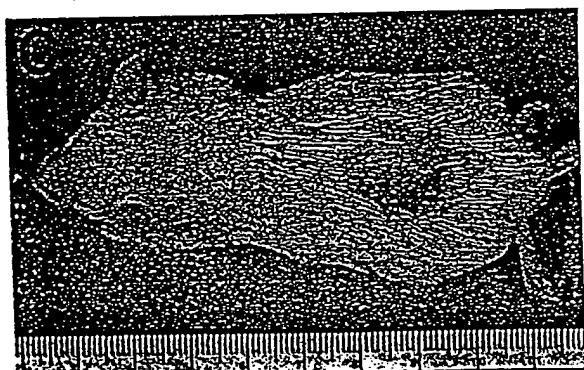


FIG. 20C

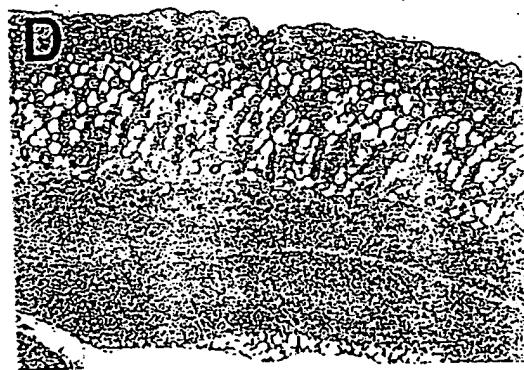


FIG. 20D

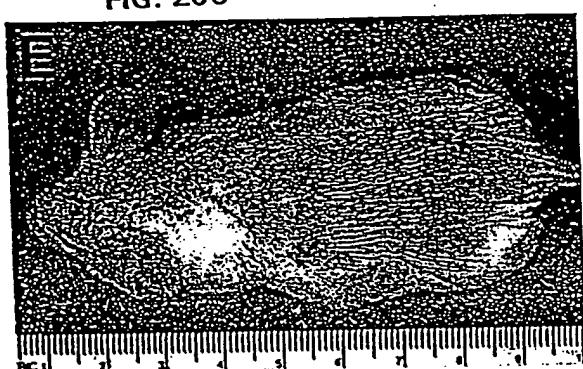


FIG. 20E



FIG. 20F

**BEST AVAILABLE COPY**

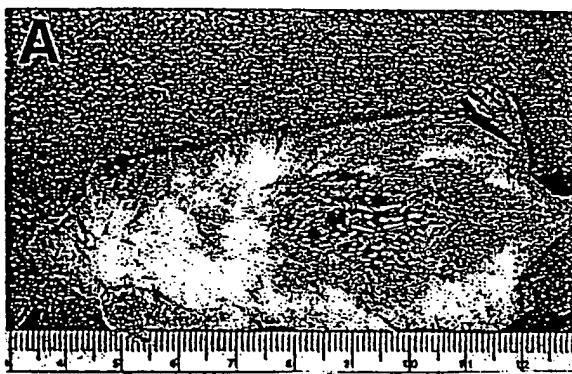


FIG. 21A



FIG. 21B

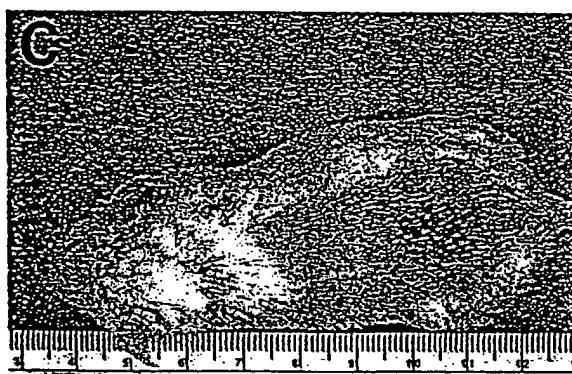


FIG. 21C

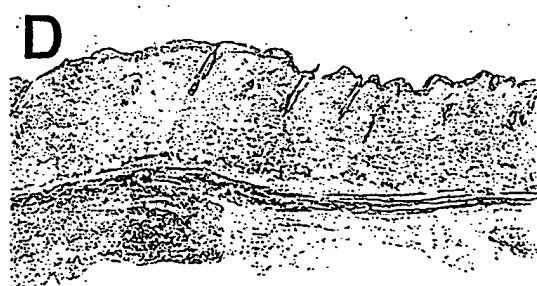


FIG. 21D

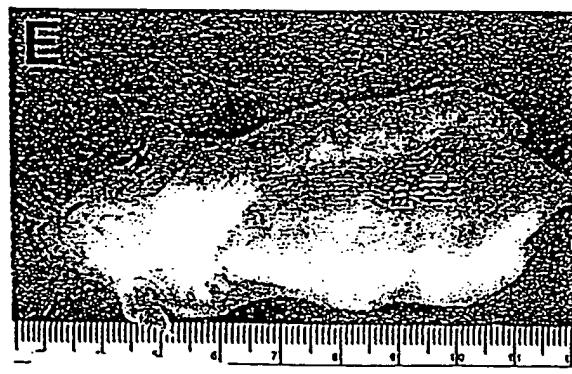


FIG. 21E



FIG. 21F

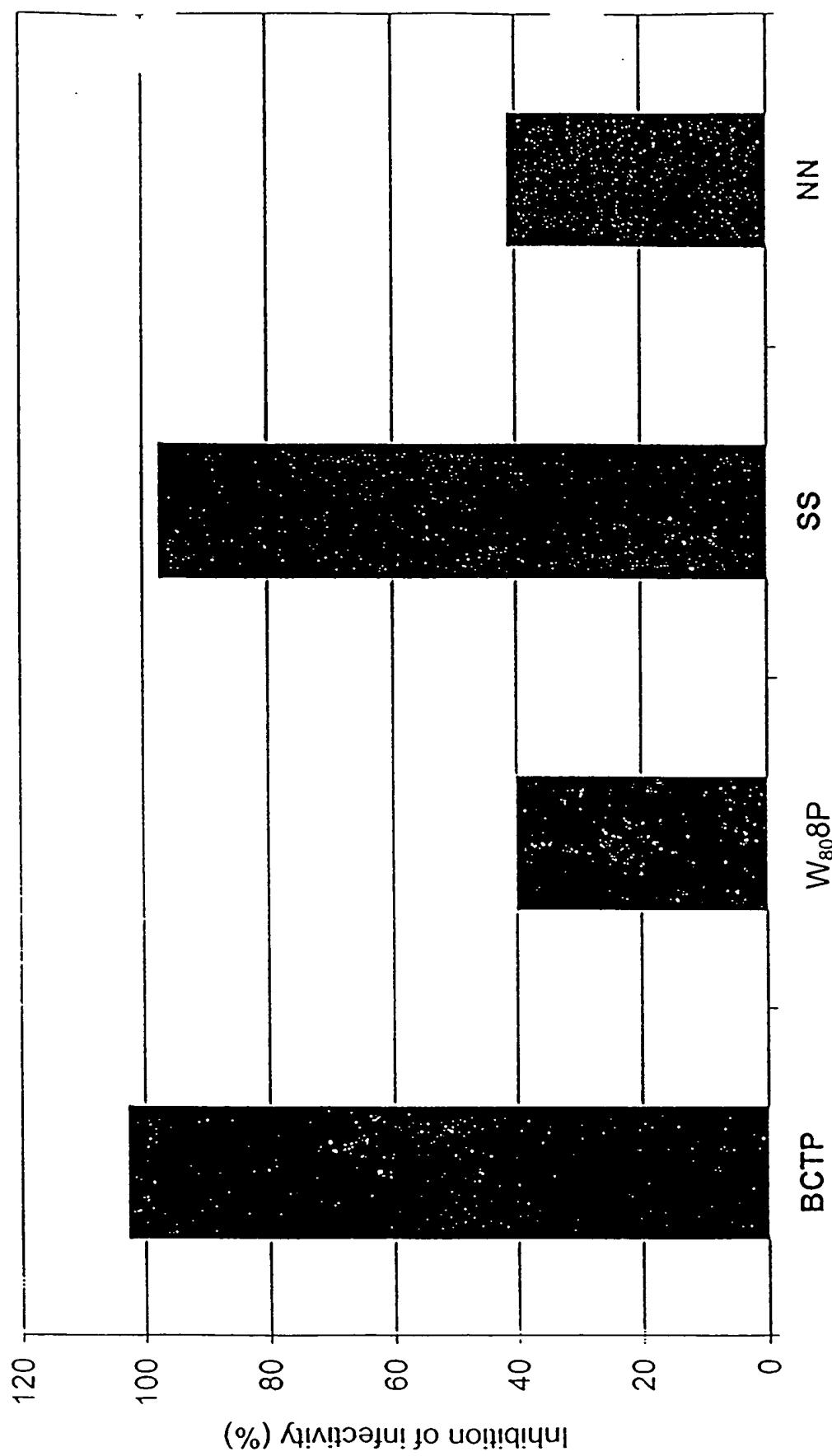
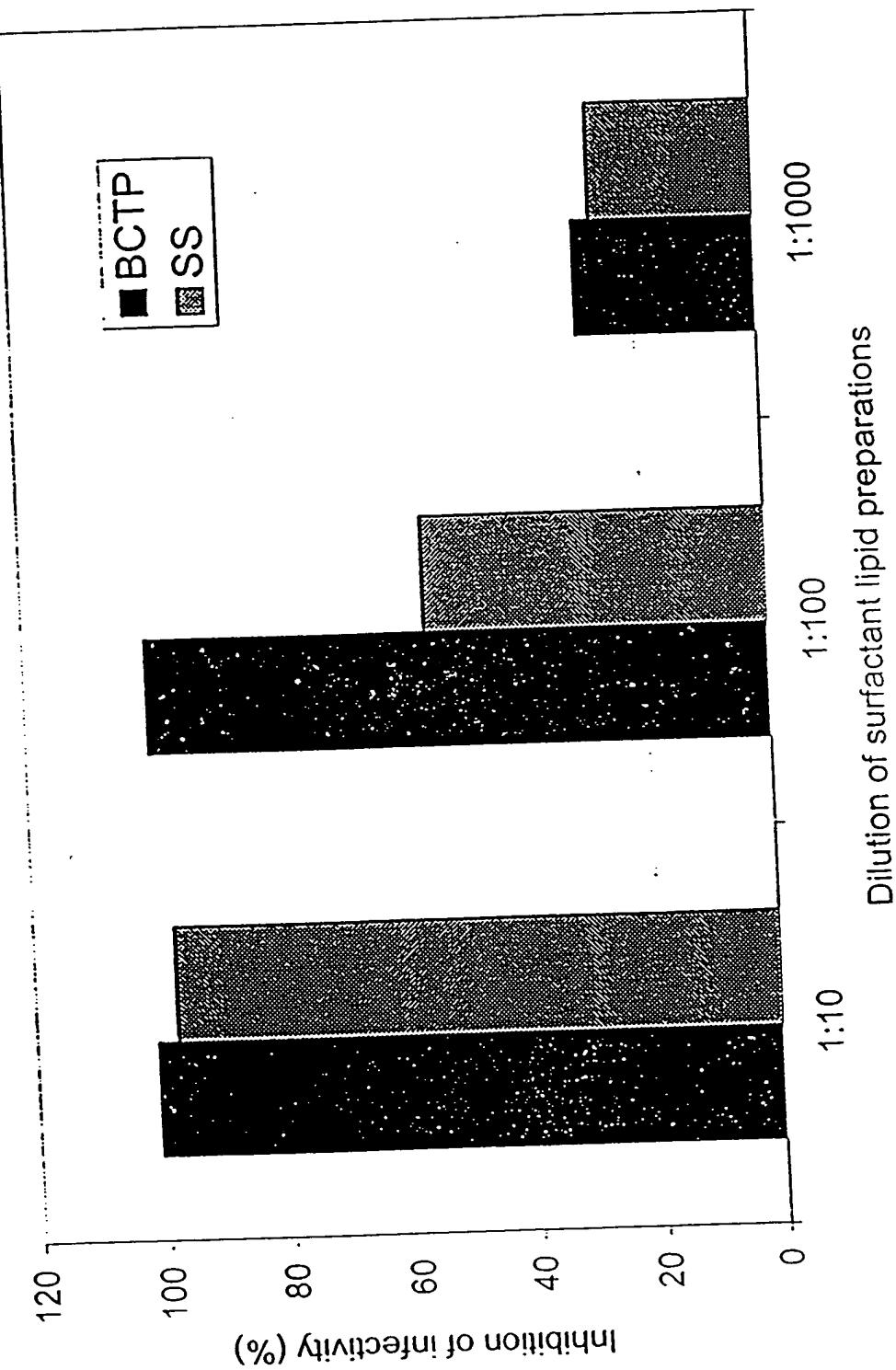


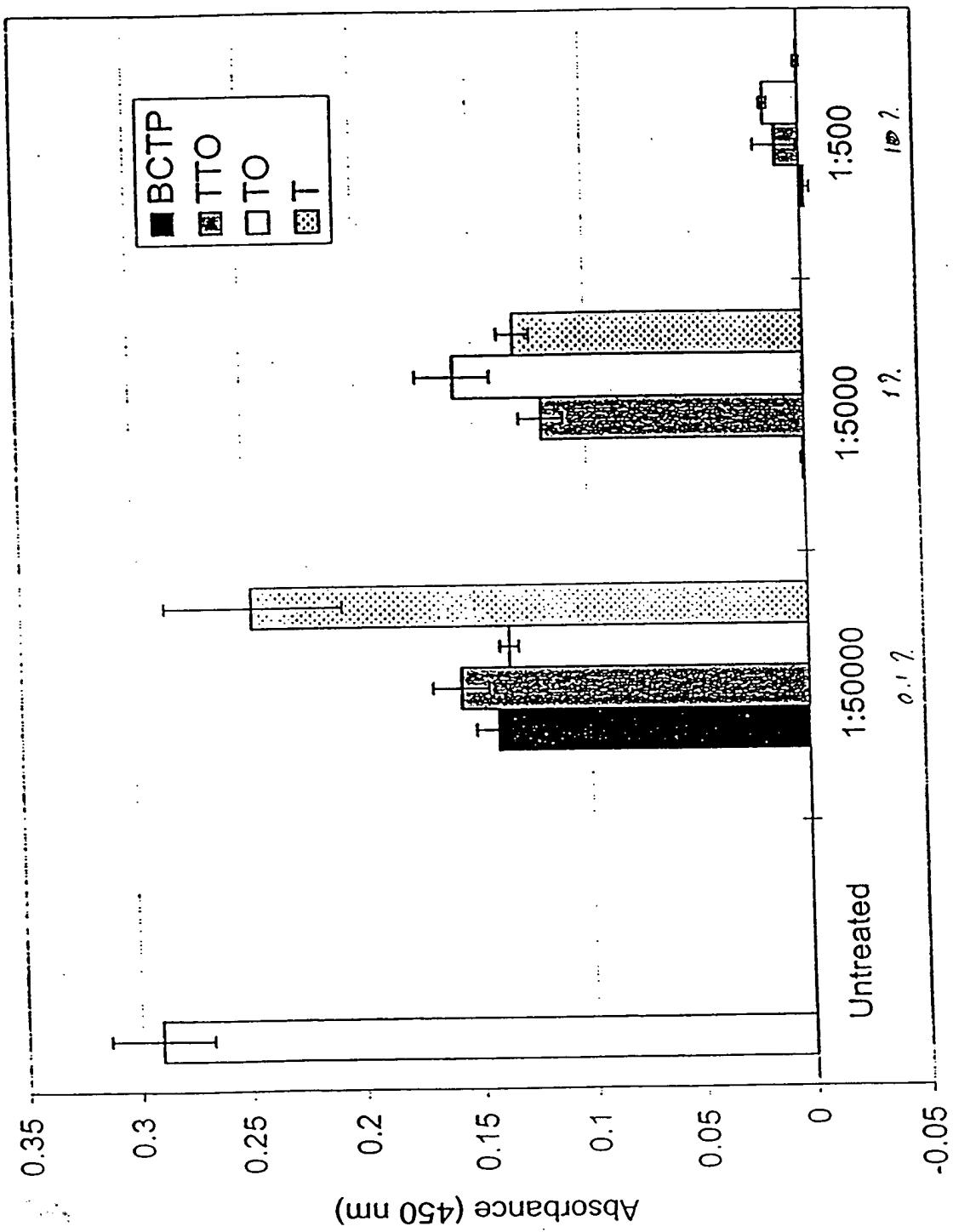
FIG. 22A

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Dilution of surfactant lipid preparations

FIG. 22B



Dilution of triton X-100

FIG. 23

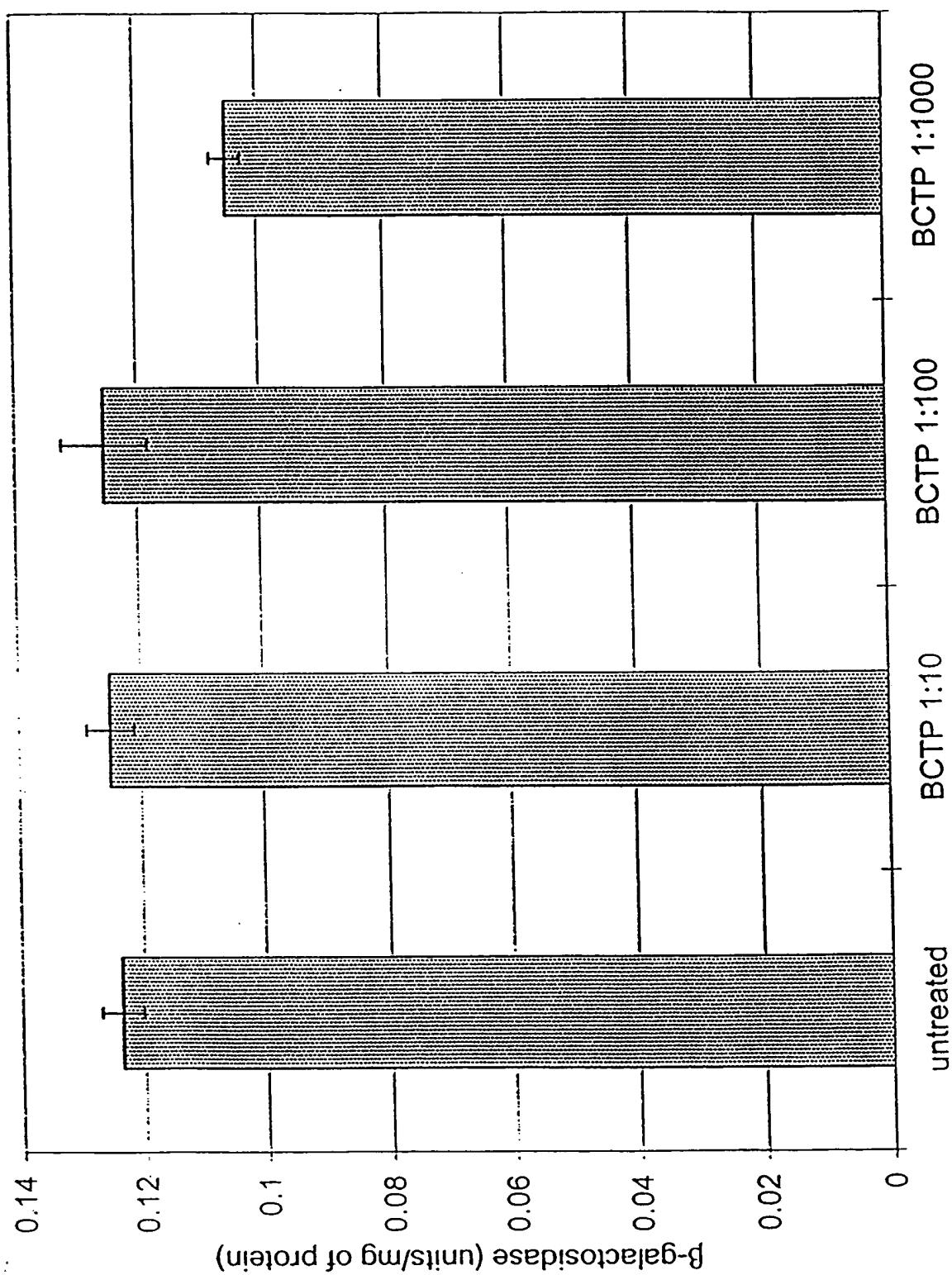


FIG. 24

**BEST AVAILABLE COPY**

**FIG. 25A**

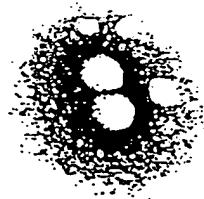


**A.**

**FIG. 25B**



**B.**



**C.**

**FIG. 25C**



**D.**

**FIG. 25D**

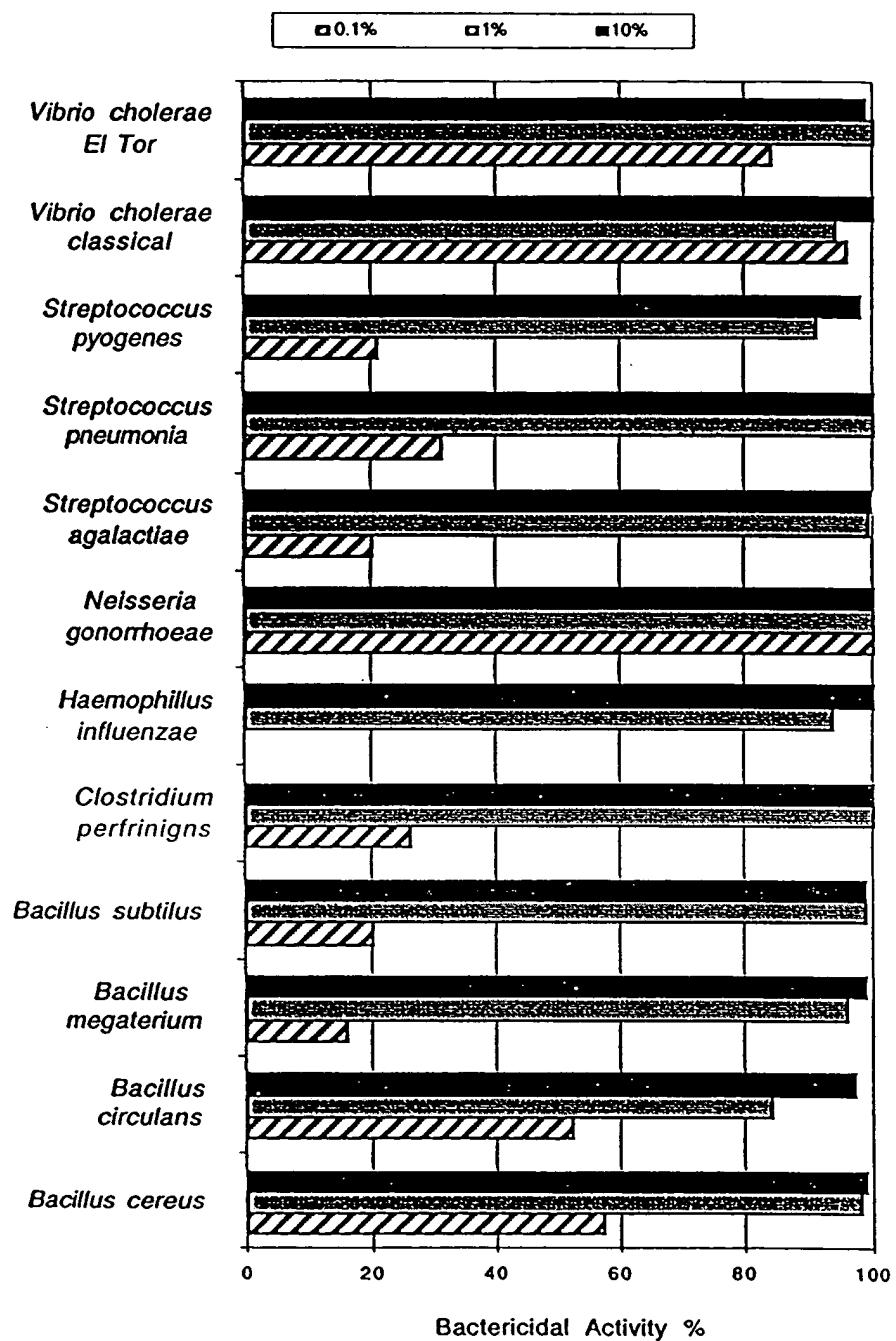


FIG. 26

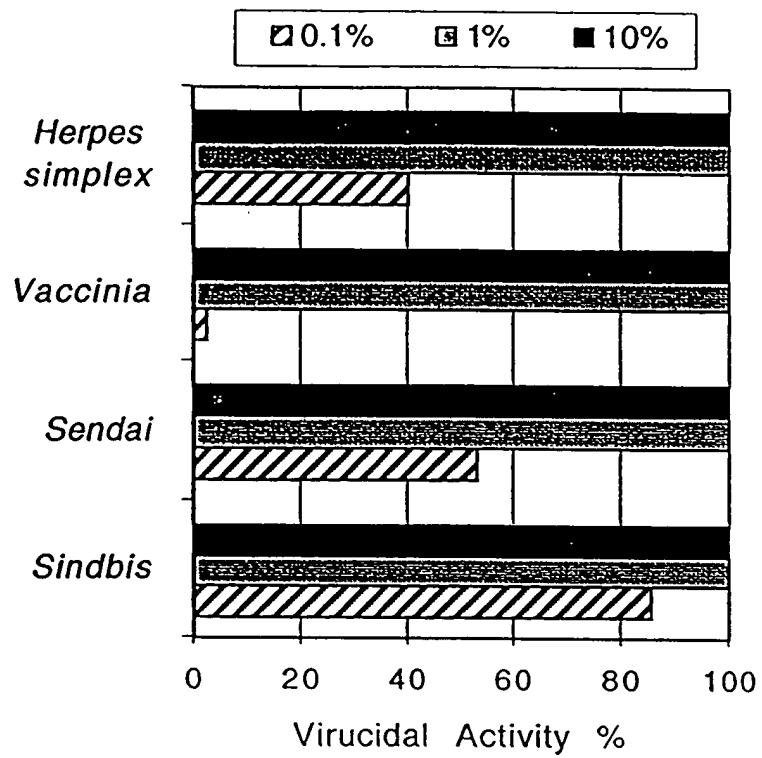


FIG. 27

MICROBE	
Bacteria	<p><i>Bacillus</i> (including <i>B. cereus</i>, <i>B. anthracis</i>, <i>B. circulans</i>, <i>B. subtilis</i>, and <i>B. megaterium</i>);</p> <p><i>Clostridium</i> (including <i>C. botulinum</i>, <i>C. tetani</i>, and <i>C. perfringens</i>);</p> <p><i>E. coli</i>;</p> <p><i>Haemophilus</i> (including <i>H. influenzae</i>);</p> <p><i>Listeria monocytogenes</i>;</p> <p><i>Neisseria</i> (including <i>N. gonorrhoeae</i>);</p> <p><i>Proteus</i> (including <i>P. mirabilis</i>);</p> <p><i>Pseudomonas</i> (including <i>P. aeruginosa</i>);</p> <p><i>Shigella</i> (including <i>S. dysenteriae</i>);</p> <p><i>Salmonella</i> (including <i>S. typhimurium</i>);</p> <p><i>Staphylococcus</i> (including <i>S. aureus</i>)</p> <p><i>Streptococcus</i> (including <i>S. agalactiae</i>, <i>S. pneumonia</i>, <i>S. pyogenes</i>);</p> <p><i>Vibrio</i> (including <i>V. cholerae</i> classical and Eltor); and</p> <p><i>Yersinea</i> (including <i>Y. enterocolitica</i> and <i>Y. pseudotuberculosis</i>); and</p>
Enveloped virus	<p><i>Influenza</i> (including A, B and C);</p> <p><i>Herpes</i> (including <i>H. simplex</i>);</p> <p><i>Sendai</i>;</p> <p><i>Sindbis</i>; and</p> <p><i>Pox virus</i> (including <i>vaccinia</i>)</p>
Fungi	<p><i>Candida</i> (including <i>C. albicans</i> and <i>C. tropicalis</i>);</p> <p><i>Trichophyton</i> (including <i>T. rubrum</i> and <i>T. mentagrophytes</i>);</p> <p><i>Microsporum gypseum</i>;</p> <p><i>Byssochlymus fulva</i></p>

FIG. 28

Emulsion Formulas		Result
ATB-X100		Effective against enveloped viruses, all Gram positive bacteria, all Gram negative bacteria and fungi
8%	Triton X-100	
8%	Tributyl Phosphate	
64%	Soybean Oil	
1%	CPC	
19%	DiH2O	
ATB-T60		Slightly less effective than ATB-X100;  Effective against enveloped viruses, all Gram positive bacteria, all Gram negative bacteria and fungi
5%	Tween 60	
8%	Tributyl Phosphate	
64%	Soybean Oil	
1%	CPC	
22%	DiH2O	
ATB-XT160		Effective against enveloped viruses, all Gram positive bacteria, all Gram negative bacteria and fungi
0.71%	Tween 60	
8%	Triton X-100	
8%	Tributyl Phosphate	
64%	Soybean Oil	
1%	CPC	
18.29%	DiH2O	
ATB-X		Effective against enveloped viruses, all Gram positive bacteria, all Gram negative bacteria and fungi;
5%	Triton X-100	
5%	Tributyl Phosphate	
40%	Soybean Oil	
1%	CPC	
49%	DiH2O	

FIG. 29

90% ATB-T22E/GE		Effective against enveloped viruses, all Gram positive bacteria, all Gram negative bacteria and fungi; Increased safety for oral uptake
1.8%	Triton X-100	
1.8%	Tyloxapol	
7.2%	Ethanol (200 Proof)	
57.6%	Soybean Oil	
0.9%	CPC	
0.09%	Peppermint Oil	
5 mM	Inosine	
5 mM	L-Alanine	
10 mM	Ammonium Chloride	
1 mM	Sodium Phosphate	
13 mM	Sodium Chloride	
30.61%	DiH <sub>2</sub> O	
ATB-T3E		Effective against all Gram positive bacteria, all Gram negative bacteria; Increased safety for oral uptake
3%	Tyloxapol	
8%	Ethanol	
64%	Soybean Oil	
1%	CPC	
0.1%	Peppermint Oil	
23.9%	DiH <sub>2</sub> O	
ATB-X100E		
8%	Triton X-100	
8%	Ethanol	
64%	Soybean Oil	
1%	CPC	
19%	DiH <sub>2</sub> O	
ATB_Tween 20 E		Effective against all Gram negative bacteria.
5%	Tween 20	
1%	CPC	
64%	Soybean Oil	
8%	Ethanol	
22%	DiH <sub>2</sub> O	

\* \* \*

ATB-T22/GE		Effective against enveloped viruses, all Gram positive bacteria, Gram negative bacteria, and bacterial spores
2%	Triton X-100	
2%	Tyloxapol	
8%	Tributyl Phosphate	
64%	Soybean Oil	
1%	CPC	
0.1%	Peppermint Oil	
5 mM	Inosine	
5 mM	L-Alanine	
10 mM	Ammonium Chloride	
1 mM	Sodium Phosphate	
13 mM	Sodium Chloride	
22.9%	DiH <sub>2</sub> O	
90% ATB-T22/GE		Effective against enveloped viruses, Gram negative bacteria, all Gram positive bacteria, and bacterial spores; liquid enough to spray
1.8%	Triton X-100	
1.8%	Tyloxapol	
7.2%	Tributyl Phosphate	
57.6%	Soybean Oil	
0.9%	CPC	
0.09%	Peppermint Oil	
5 mM	Inosine	
5 mM	L-Alanine	
10 mM	Ammonium Chloride	
1 mM	Sodium Phosphate	
13 mM	Sodium Chloride	
30.61%	DiH <sub>2</sub> O	
ATB-T22E		Effective against enveloped viruses, all Gram positive bacteria, all Gram negative bacteria and fungi; Increased safety for oral uptake
2%	Triton X-100	
2%	Tyloxapol	
8%	Ethanol (200 Proof)	
64%	Soybean Oil	
1%	CPC	
0.1%	Peppermint Oil	
22.9%	DiH <sub>2</sub> O	

ATB-T3		Effective against enveloped viruses, all Gram positive bacteria, all Gram negative bacteria and fungi	
3%	Tyloxapol		
8%	Tributyl Phosphate		
64%	Soybean Oil		
1%	CPC		
0.1%	Peppermint Oil		
23.9%	DiH <sub>2</sub> O		
ATB-T3E pH7.1		Effective against, all Gram positive bacteria, all Gram negative bacteria and spores	
3%	Tyloxapol		
8%	Ethanol		
64%	Soybean Oil		
1%	CPC		
0.1%	Peppermint Oil		
23.8%	DiH <sub>2</sub> O		
0.1%	10N NaOH	Effective against enveloped viruses, all Gram positive bacteria, all Gram negative bacteria and fungi; stable despite lower amount of detergent	
ATB-T22			
2%	Triton X-100		
2%	Tyloxapol		
8%	Tributyl Phosphate		
64%	Soybean Oil		
1%	CPC		
0.1%	Peppermint Oil		
22.9%	DiH <sub>2</sub> O	Effective against enveloped viruses, all Gram positive bacteria, all Gram negative bacteria, and bacterial spores	
ATB-1X			
8%	Triton X-100		
8%	Tributyl Phosphate		
64%	Soybean Oil		
1%	CPC		
0.1%	Peppermint Oil		
5 mM	Inosine		
5 mM	L-Alanine		
10 mM	Ammonium Chloride		
1 mM	Sodium Phosphate		
13 mM	Sodium Chloride		
18.9%	DiH <sub>2</sub> O		

ATB-X1001		Effective against enveloped viruses, all Gram positive bacteria, all Gram negative bacteria and fungi
8%	Triton X-100	
8%	Tributyl Phosphate	
50%	Soybean Oil	
1%	CPC	
33%	DiH2O	
ATB-X1002		Effective against enveloped viruses, all Gram positive bacteria, all Gram negative bacteria and fungi; more irritating than ATB-X100.
8%	Triton X-100	
8%	Tributyl Phosphate	
50%	Soybean Oil	
2%	CPC	
32%	DiH2O	
ATB-2		Effective against enveloped viruses, all Gram positive bacteria, all Gram negative bacteria and fungi
0.1%	Peppermint Oil	
8%	Triton X-100	
8%	Tributyl Phosphate	
64%	Soybean Oil	
2%	CPC	
17.9%	DiH2O	
ATB-CPB		Effective against enveloped viruses, all Gram positive bacteria, all Gram negative bacteria
0.1%	Peppermint Oil	
8%	Triton X-100	
8%	Tributyl Phosphate	
64%	Soybean Oil	
1%	CPB	
18.9%	DiH2O	
ATB-1/2		Effective against enveloped viruses, all Gram positive bacteria, all Gram negative bacteria and fungi, demonstrates that dilution doesn't affect the efficacy of ATB-X100
0.05%	Peppermint Oil	
4%	Triton X-100	
4%	Tributyl Phosphate	
32%	Soybean Oil	
0.5%	CPC	
59.45%	DiH2O	

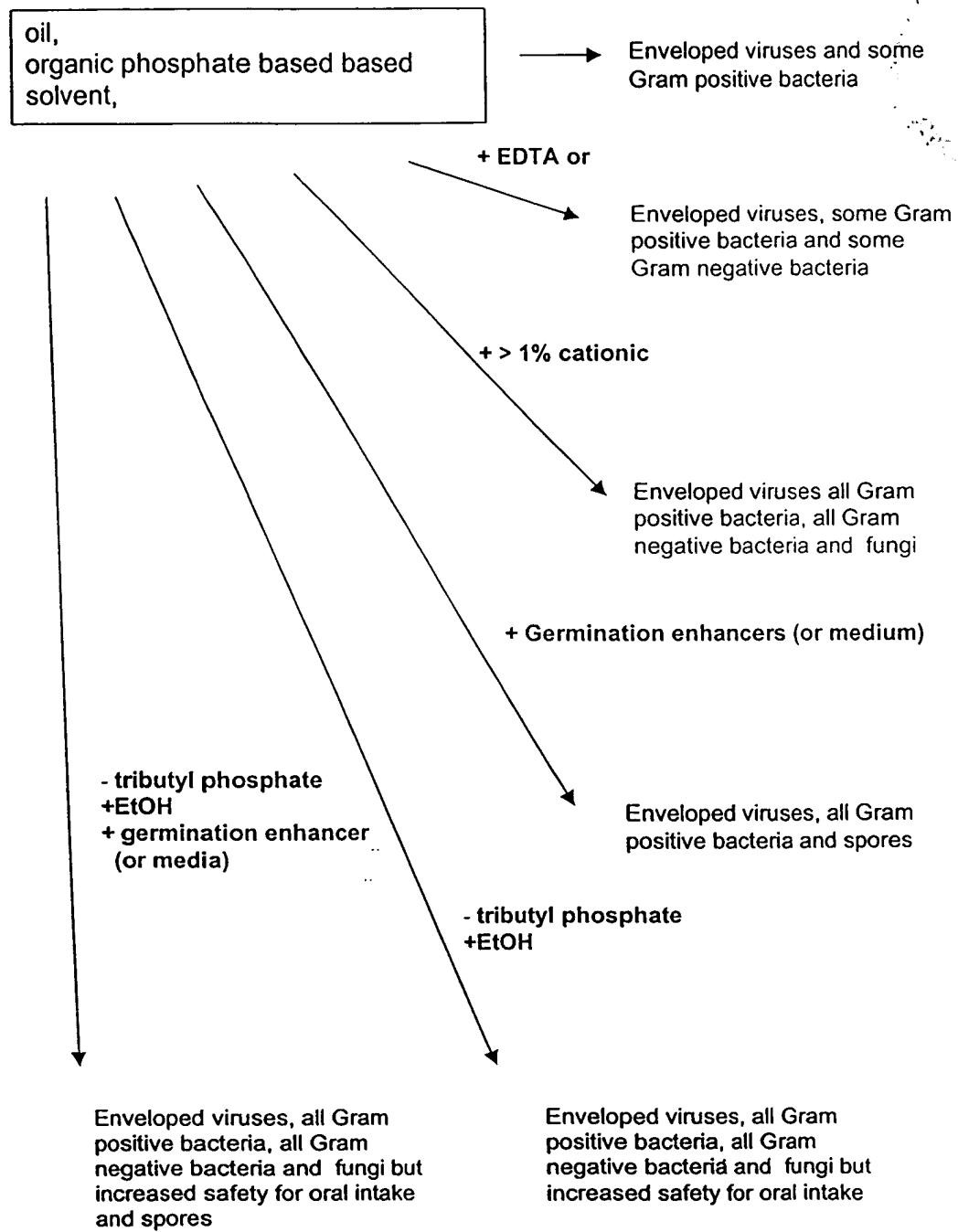


FIG. 30

FIGURE 31A

Log reduction of *E. coli* by various emulsions

(Rotator, 15min in media)

Emulsion	10%	1%	0.10%
50% X8PC	5.67	2.09	0
D2P	0.17	0	0
EC	5.81	5.81	4.42
GC10	6.02	6.02	6.02
P <sub>5</sub> C*	5.49	5.49	2.39
S <sub>60</sub> 8GL5	0	0	0
S8GL1B1	0	0	0
S8P	0.2	0.18	0.067
W <sub>20</sub> 10EA5*	0	0	0
W <sub>20</sub> 10ECH <sub>3</sub> *	0	0	0
W <sub>20</sub> 10EQ <sub>100</sub> x	0	0	0
W <sub>20</sub> 10EQ <sub>10</sub> x	0	0	0
W <sub>20</sub> 5EC	6.22	6.22	5.48
W <sub>60</sub> PC	5.81	5.81	2.62
W <sub>80</sub> 5EC	6.13	6.13	3.97
X2Y2C*	5.64	5.64	2.37
X2Y2EC	5.61	5.61	5.61
X2Y2P <sub>4</sub> C	5.93	5.93	4
X2Y2PC	5.67	5.67	5.67
X4Y4E	0	0	0
X8E	0	0	0
X8P BC	5.93	4.41	0
X8P CPB	5.59	5.59	2.8
X8P CPB	4.26	0.35	0
X8P CTAB	4.04	0.16	0
X8P Tannic acid	3.84	0	0
X8PC	5.59	5.59	1.79
X8PC2	5.59	5.59	4.42
X8W <sub>60</sub> PC	5.58	5.58	1.05
Y3C	5.48	5.48	3.54
Y3E	0.25	0.19	0.05
Y3EC	6.13	6.13	6.13
Y3EVc5	0	0	0
Y3PC	5.31	5.31	5.31
Y8EC	5.81	5.81	4.62
Y8EC S	0.08	0.08	0.04

**FIGURE 31B**

**Log reduction of *B. globigii* spores by various emulsions**  
 (Rotator, 4 hours in germination enhancers)

Emulsion	10%	1%	0.10%
50% X8PC	2.21	2.6	2.46
D2P	0.94	1.28	1.75
S8P	0.53	0.94	1.27
W <sub>80</sub> 4Y4E	1.01	1.09	1.5
W <sub>80</sub> 4Y4EC	1.84	2.46	2.62
W <sub>80</sub> 5E	0.73	1.12	1.94
W <sub>80</sub> 5EC	1.8	2.31	2.6
X2E	2.4	2.27	0.5
X2E	2.44	1.15	0.86
X2Y2C	2.63	2.37	4.22
X2Y2E	1.88	1.24	1.08
X2Y2EC	2.55	2.83	3.13
X2Y2EC	1.94	2.19	2.6
X2Y2P <sub>4</sub> C	2.78	2.71	3.44
X2Y2PC	2.93	2.72	4.11
X2Y2PC	2.67	2.57	3.73
X2Y2PC	2.8	2.71	3.95
X2Y6E	2.2	1.73	0.97
X3E	2.49	2.23	1.14
X4E	2.43	2.38	2.44
X4E	2.49	2.25	0.95
X4Y4E	2.61	1.89	1.31
X5E	2.44	2.51	0.41
X5P <sub>5</sub> C	2.39	2.42	2.62
X6E	2.44	2.64	0.92
X6Y2E	2.7	2.62	1.72
X8E	2.19	2.28	0.47
X8E	2.42	2.55	0.92
X8E O	1.26	1.32	0.96
X8PC	2.6	2.73	2.79
X8PC2	2.41	2.47	2.72
Y2PC*	1.37	1.57	3.2
Y3PC	2.32	2.57	3.8
Y3PC	2.33	2.44	3.31
Y8E	0.17	0.3	0.59
Y8E	0.49	0.59	0.6
Y8E O	1.02	0.56	0.7
Y8EC	2.01	2.39	2.56
Y8P	0.89	0.57	0.64

**FIGURE 31C**

Log reduction of INF A pfu/ml treated with nanoemulsion series  
as measured by plaque reduction assay (30 min incubation)

**Logs of Reduction**

Compound	1:10	1:100	1:1000
X2Y2E	0	0	0
X4Y4E	0	0	0
X6Y2E	0	0	0
X2Y6E	1.93	0	0
S608GLS	0	0	0
Y8E	0	0	0
Y3E	0	0	0
Y8ES	0	0	0
Y8	0	0	0
X2E	2.08	1.38	0
X3E	2.6	0	0
X4E	3.16	1.61	0
X5E	3.16	1.61	0
X6E	3.42	3.42	3.42
X8E	3.86	3.86	0
X8E (unpurified oil)	3.86	3.21	0
X8G	2.74	2.74	0
X8B	3.82	2.36	0
X8EO	3.86	3.42	0
D2P	3.97	3.97	0.97
D2G	3.82	3.82	0.00
S3Y3G STSS	2.26	0	0.00
S8GL1BI	3.82	3.82	0.74
S8G	4.1	4.1	0.00
S8P	3.97	3.97	2.71
W <sub>80</sub> SE	0	0	0
W <sub>80</sub> 4Y4E	0	0	0
W <sub>80</sub> 8	0	0	0
W <sub>20</sub> SE	0	0	0
W <sub>80</sub> 4Y4EC	3	3	2
W <sub>80</sub> SEC	3	3	3
W <sub>20</sub> SEC	3	3	3.3
X2Y2EC	3	3	2
X2Y2PC	3	3	3
X8PC	4.98	4.98	4.98
X8GC	4.68	4.68	4.68
X8EC	4.1	4.1	1.97
Y8EC	3	3	2
Y3EC	3	3	2
Y3EC	3	3	2.12
Y3PC	3	3	2.63
EC	3	3	3
GC	4.14	4.14	4.14
ATB-EDTA	3	3	1.98
Y2X2SPC	1.10	1.10	0

S= sorbic acid

B= Benzyl Benzoate

O= Olive oil

S= SDS

S= SDS

S= SDS

S= SDS

Treatment of *S. typhimurium* with W<sub>205</sub>EC containing 0.1% EDTA  
(40°C water bath, 15 minutes, dilutions in tap water, 10% biological load)

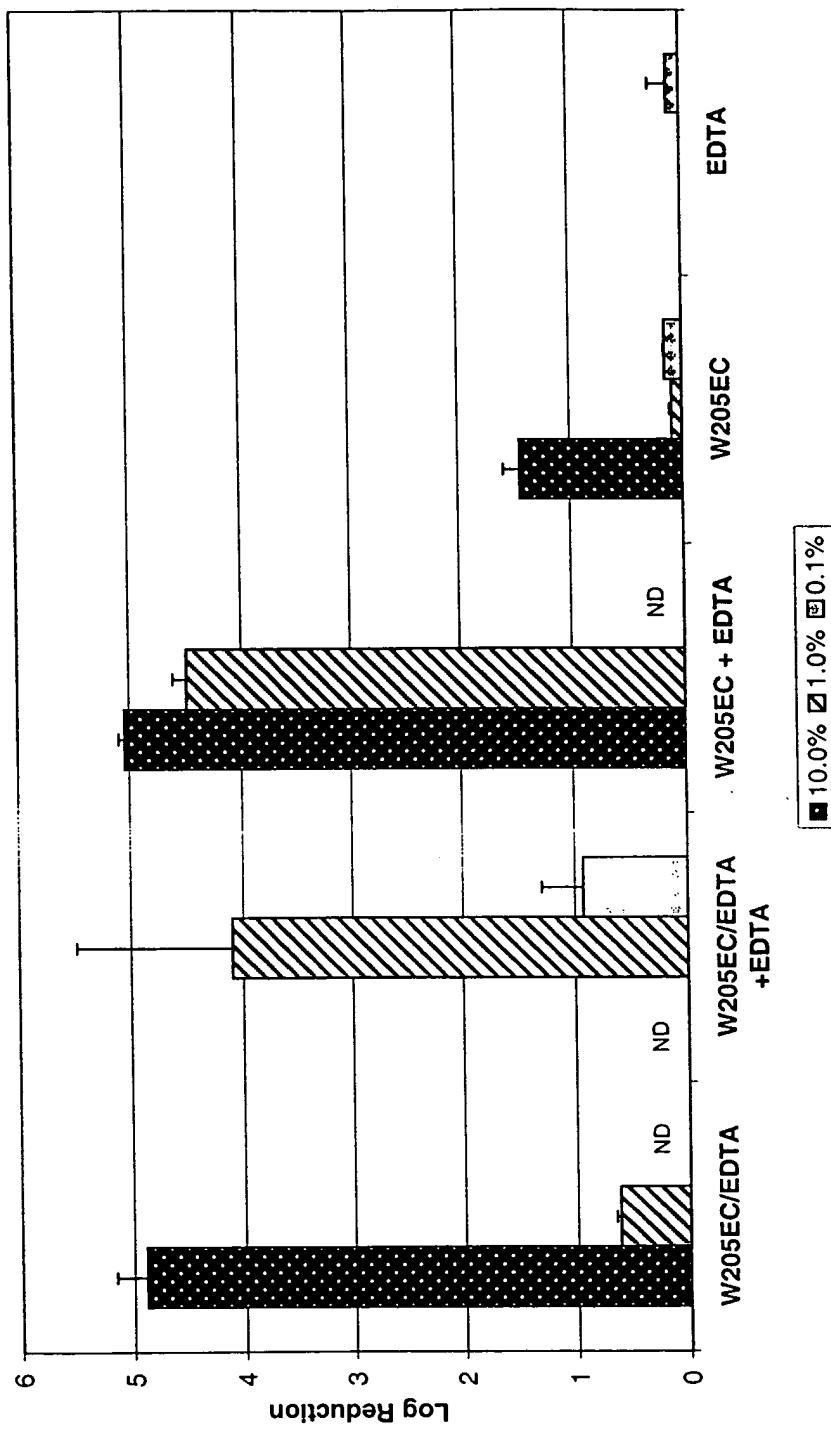


FIGURE 32

Treatment of *S. typhimurium* with  $W_{20}5EC$  containing 0.1% EDTA  
(50°C water bath, dilutions in tap water, 10% biological load)

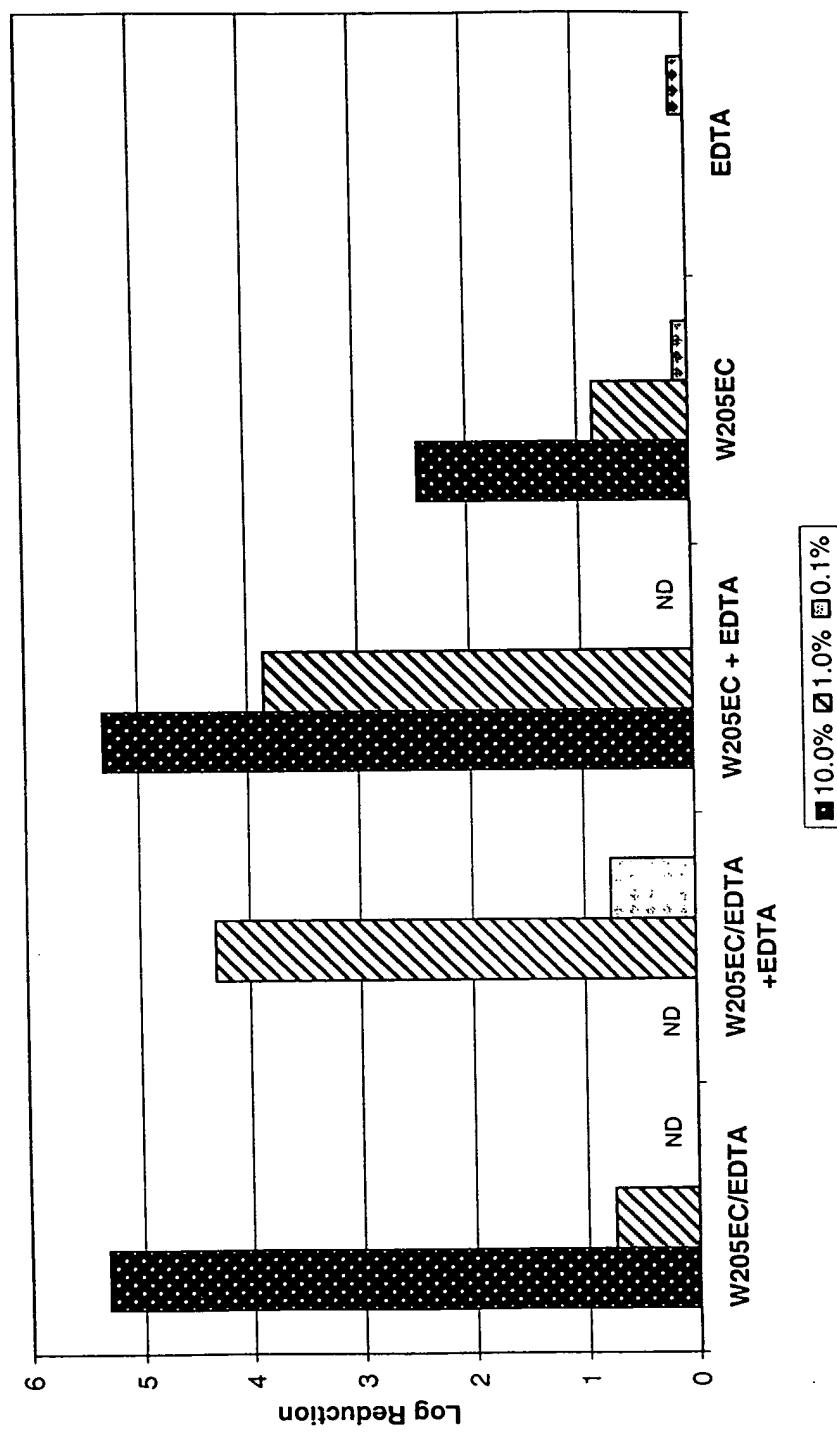
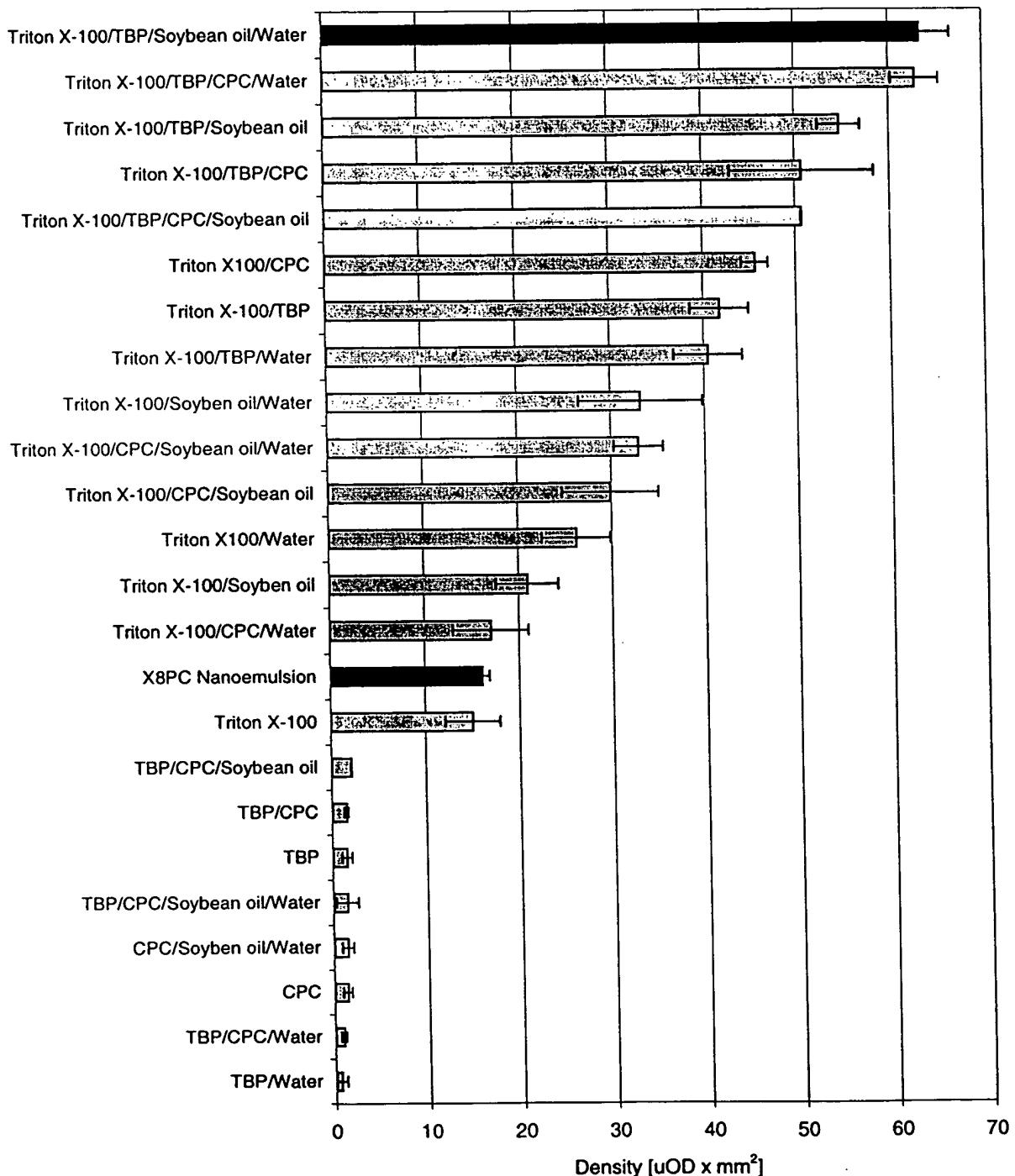


FIGURE 33

**FIGURE 34**

**Lytic effect of X8PC and its ingredients on sheep red blood cells as tested on blood agar plates**



Log Reduction of *Mycobacteria fortuitum* by X8PC at Room Temp and 37 °C

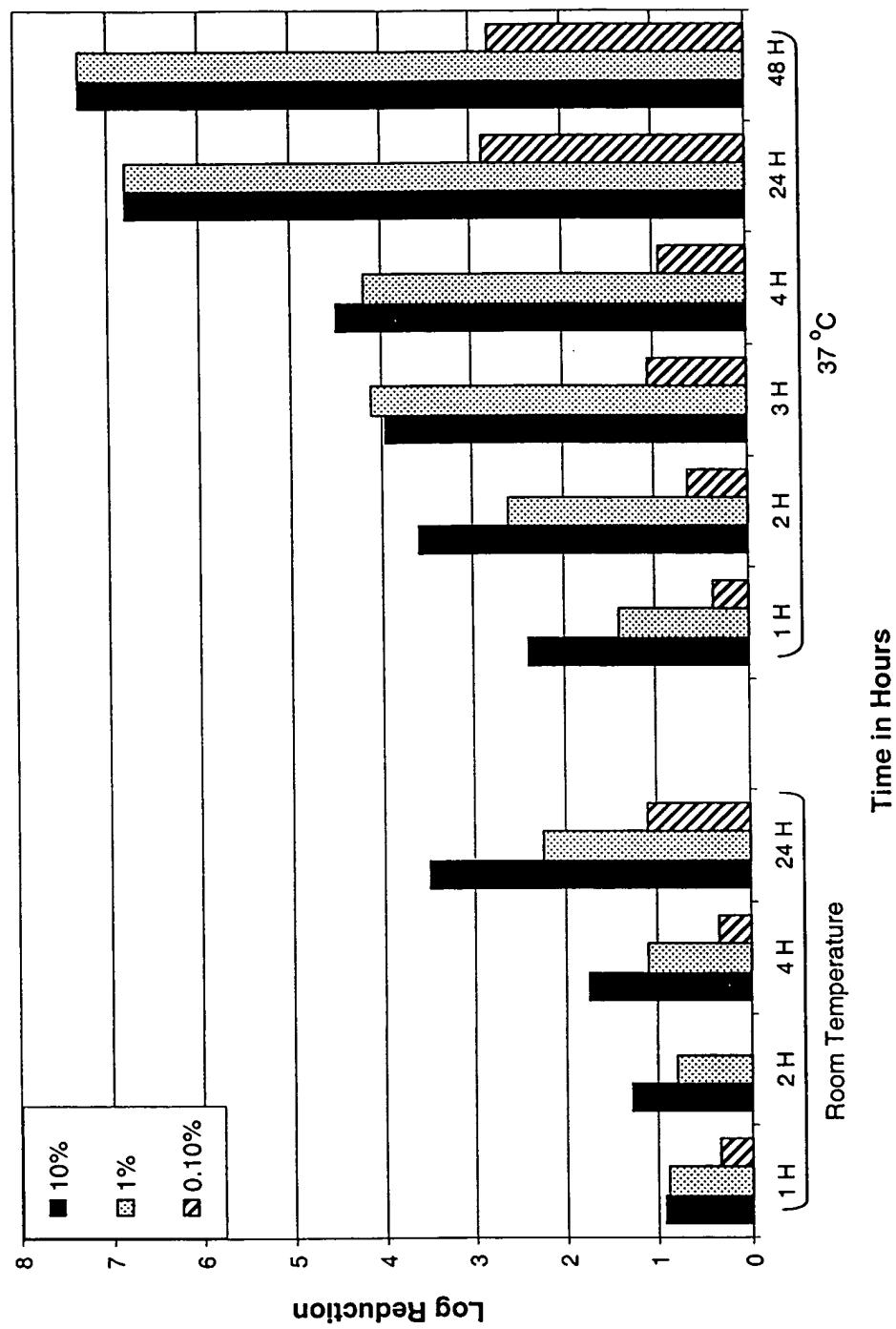


FIGURE 35

**FIGURE 36**

**diH<sub>2</sub>O**

Treatment type	Pre Treatment Count per sq ft	Post Treatment Count per sq ft	Runoff (5 minutes)
W <sub>20</sub> 5EC 50°C	5.63 X 10 <sup>7</sup>	0	0
W <sub>20</sub> 5EC RT	8.05 X 10 <sup>7</sup>	0	6 X 10 <sup>5</sup>
H <sub>2</sub> O 50°C	7.96 X 10 <sup>7</sup>	0	too numerous to count
H <sub>2</sub> O RT	1.15 X 10 <sup>8</sup>	0	too numerous to count

**Distilled Water**

Treatment type	Pre Treatment Count per sq ft	Post Treatment Count per sq ft	Runoff (5 minutes)
W <sub>20</sub> 5EC 50°C	2.9 X 10 <sup>8</sup>	0	0
W <sub>20</sub> 5EC 40°C	1.7 X 10 <sup>8</sup>	3.46 X 10 <sup>5</sup>	1.8 X 10 <sup>5</sup>
H <sub>2</sub> O 50°C	2.13 X 10 <sup>7</sup>	0	1.5 X 10 <sup>8</sup>
H <sub>2</sub> O 40°C	1.3 X 10 <sup>8</sup>	2.3 X 10 <sup>5</sup>	6.7 X 10 <sup>7</sup>

**Tap Water**

Treatment type	Pre Treatment Count per sq ft	Post Treatment Count per sq ft	Runoff (5 minutes)
W <sub>20</sub> 5EC 50°C	1.4 X 10 <sup>8</sup>	0	3 X 10 <sup>5</sup>
W <sub>20</sub> 5EC 40°C	5.65 X 10 <sup>7</sup>	0	6 X 10 <sup>5</sup>
W <sub>20</sub> 5EC RT	1.9 X 10 <sup>8</sup>	5.76 X 10 <sup>4</sup>	1.26 X 10 <sup>6</sup>
H <sub>2</sub> O 50°C	1.75 X 10 <sup>8</sup>	0	4.68 X 10 <sup>7</sup>
H <sub>2</sub> O 40°C	6.35 X 10 <sup>7</sup>	0	2.2 X 10 <sup>8</sup>
H <sub>2</sub> O RT	2.74 X 10 <sup>6</sup>	4 X 10 <sup>5</sup>	1.5 X 10 <sup>8</sup>